

The United States MILLER

AND THE MILLING ENGINEER.

Fourteenth Year.—No. 7.

MILWAUKEE, JULY, 1889.

Subscription Price, \$1.00 Per Year.

MILWAUKEE MILLS.

WE present on this page illustrations of six of the principal flouring mills in Milwaukee. The mills in this city have an aggregate daily capacity of 9,100

the other two are not. All these mills are fitted up in the most approved modern style and manufacture extensively for the export trade. It is a well-known fact that Milwaukee flour has a first-class reputation in both domestic

the slow combustion type, and there is no need for either stop valve, blow-off cocks, gage glass or safety valve. The feed water, upon entering the capillary channel within the tube, is instantly converted into steam, and issues perfectly dry. The inventor claims that owing to

the great velocity with which water and steam must pass through the boiler, there is no possibility of scale accumulating. The tube of a one horse power boiler is 6 feet 6 inches long, and when flattened out 4 inches wide, its total heating surface is about 5 square feet, and it is said

regulated by regulating the amount of feed water sent into the boiler, and for this purpose the inventor arranges the regulator of the engine either to act upon the waste cock of the feed pump, or upon a sliding block by which the stroke of the feed pump is altered. There being practically no water in the boiler,

the regulation is said to be as precise and quick as with the usual type of engines. To stop the engine it is only necessary to close the cock on the suction pipe of the pump, or open the waste cock fully. The boiler has been applied to a steam driven tricycle in the streets of Paris. The boiler was carried behind the axle of the main driving wheels, and the engine was fixed under the rider's seat, which also contains a supply of water and fuel. A speed of 6½ miles an hour was attained over roads having 15 per cent. grades. The weight of the tricycle in service, but without the rider, is 3½ cwt.

"The distribution of bread, after it is baked," says Edward Atkinson, "now costs the average workman in a city as much as it does to

grow the wheat, mill it, barrel it, move it 1,500 miles, and convert it into bread, all put together."



barrels per day, and produced during the year 1888, 1,421,258 barrels of flour. The mills here illustrated are the "Eagle Mills," owned by J. B. A. Kern & Son, daily capacity 2,000 bbls.; the "Phoenix Mills," owned by E. Sanderson & Co., daily capacity 2,000; the "Daisy," owned by the Daisy Roller Mill Co.,

and foreign trade circles. From present appearances it seems quite probable that the output of Milwaukee Mills this year will exceed all former years.



capacity 1,500; the "Duluth Mills," owned by Faist, Kraus & Co., capacity 1,500; the "Jupiter Mills," owned by B. Stern, capacity 500 bbls. (increasing now); the "Reliance Mills," owned by C. Manegold & Co., capacity 600 bbls.

The "Gem Mills," "Cream City Mills" and "Centennial Mills" are not illustrated here. The "Gem Mills" are running, but

A CAPILLARY STEAM BOILER.

A French engineer has invented a new tubular boiler, for which he claims that it cannot possibly explode. The boiler consists simply of a solid drawn steel tube which has, with the exception of its two ends, been rolled out flat, so as to leave in it a channel only 0.1 to 0.3 millimetres wide. The tube is then coiled spirally, and its inner end is bent up vertically to receive the steam pipe, whilst the feed pipe is screwed into the outer end of the spiral. This spiral tube boiler is placed into a furnace which may be of

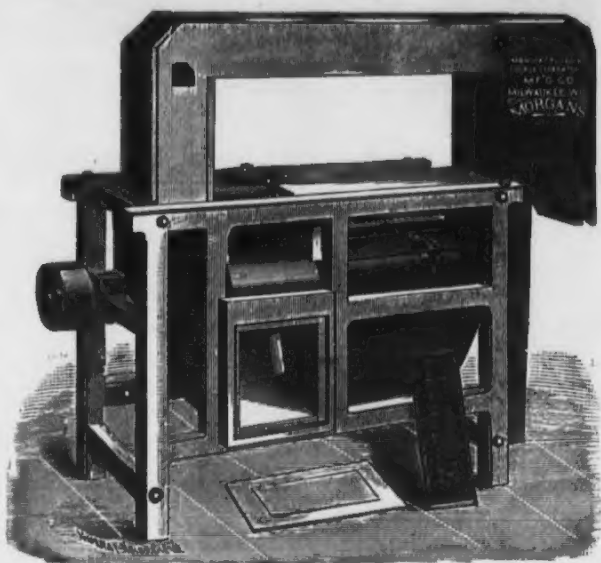
to evaporate 45 pounds of water per hour, with a consumption of 9 pounds of coal. The supply of steam to the engine is



A GROUP OF MILWAUKEE MILLS.

RECOGNIZED AS THE BEST.

The Morgan Scourer



Built either Upright or Horizontal, with or without Shoe. Hundreds of these machines are in use in the best mills of the country. They are undoubtedly the most thorough and durable Scourer on the market.

PRICES LOW. RESULTS GUARANTEED.

For Prices, Terms, etc., address

COCKLE SEPARATOR MFG. CO.,
MILWAUKEE, WIS.

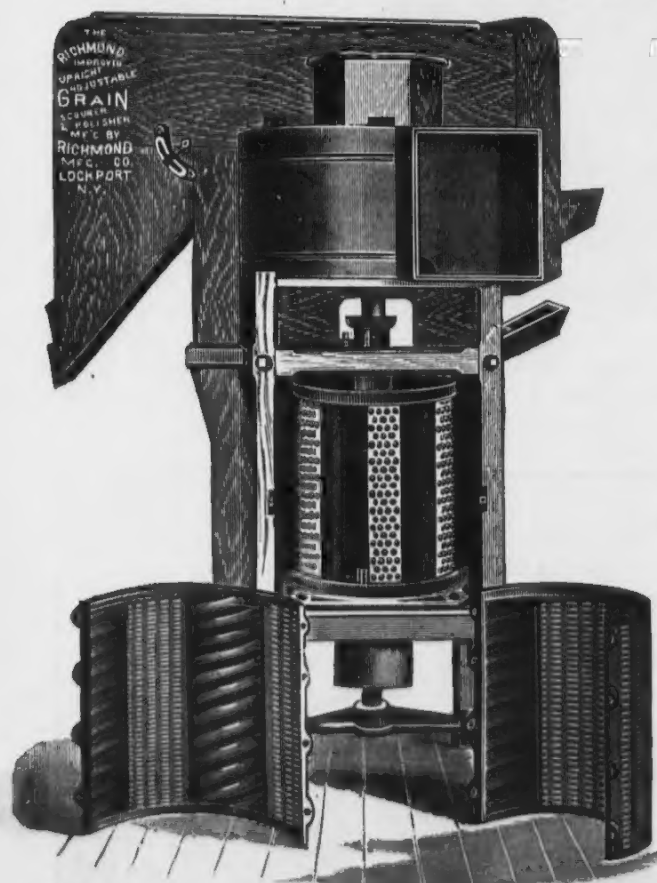
MANUFACTURERS OF

Kurth Cockle Separator. • Gilbert Reel. • Spiral Conveyor.

WE WANT YOU

To Derive the Benefits that can be Obtained by Using the

Richmond Grain Cleaning Machinery AND BRAN DUSTERS



The Richmond Improved Upright Adjustable Scourer and Polisher.

RICHMOND MANUFACTURING CO.,
LOCKPORT, N. Y., U. S. A.

Which are without
doubt the

BEST

and Most

EFFICIENT LINE

OF MACHINES

—ON THE—

MARKET.

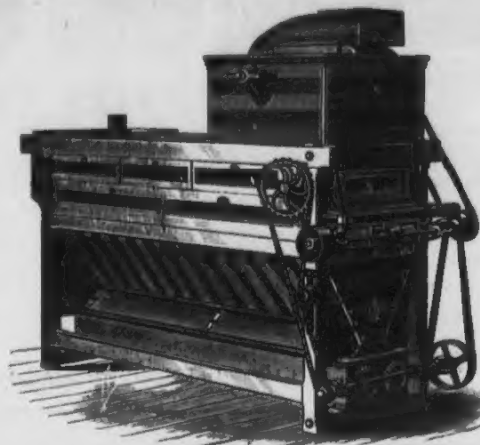
We make this state-
ment, with the
knowledge that

PROMINENT MILLERS

ENDORSE IT.

Superlative Purifier

A First-Class Machine at Reasonable Prices.



The above has been on the market for years, and is in operation in hundreds of mills. The fact that we are selling large numbers to millers who have seen it in practical operation in mills, vouches for its worth.

**Guaranteed to do as good work as any Purifier on the market
and to be first-class in construction and material.**

FOR PRICES, ETC., ADDRESS

SUPERLATIVE PURIFIER MFG. CO.
MILWAUKEE, WIS.

ALSO MANUFACTURERS OF

THE NEW ERA SCALPER.

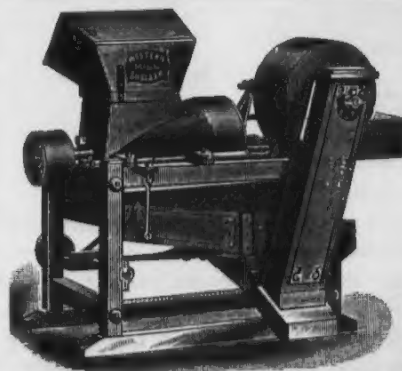
Condemnation of Competitors IS THE MEASURE OF SUCCESS.

I CHALLENGE the wheat heater concern advertising their heater as "replacing the Welch" to publish the terms on which the Welch Wheat Heaters are replaced. I could replace any other make of heater by allowing a big price for it and selling mine low, which is equal to paying a bonus.

The "Welch" is fully guaranteed, sold on its merits and used more than any heater on the market.

823 SECOND ST.,
ST. LOUIS, MISSOURI.

A. B. BOWMAN.



* THE *

"WESTERN"
MILL SHELLER.

The most Compact, Durable, Best Sheller
and Best Cleaner.

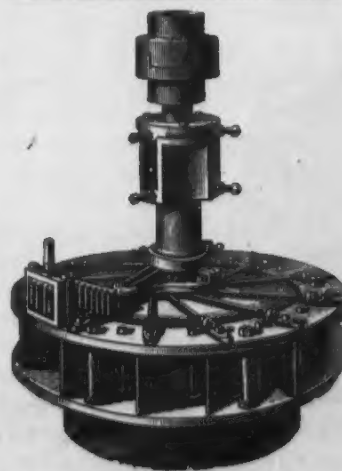
Takes up but little room, runs at low rate of
speed, requires no attention. It is in
every respect the

Best Sheller ever offered to the Public.

Please mention this paper. Write for full particulars to

UNION IRON WORKS, - DECATUR, ILL.

Mfrs. of "Western" Shellers, Cleaners, Separators, and all kinds of Elevator Machinery.



Leffel Water Wheel,

Made by **JAMES LEFFEL & CO.**

The "OLD RELIABLE" with Important Improve-
ments, making it the

Most Perfect Turbine now in Use.

Comprising the **LARGEST** and the **SMALLEST**
Wheels, under both the **HIGHEST** and **LOWEST**
Head in this country. Our New Illustrated Book
sent free to those owning water power.

Write us for **NEW PRICES** before buying else-
where. New shops and New Machinery are provided
for making this Wheel. Address,

JAMES LEFFEL & CO.,

Springfield, Ohio or 110 Liberty St., New York.

UNITED STATES MILLER AND THE MILLING ENGINEER.

E. HARRISON CAWKER, EDITOR.

M. W. THORMAEHLIN, Associate Editor.

PUBLISHED MONTHLY.

OFFICE, NO. 124 GRAND AVENUE, MILWAUKEE.

SUBSCRIPTION PRICE—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid..... \$1.00

To Canadian subscribers, postage prepaid..... 1.00

Foreign subscriptions..... 1.50

All Drafts and Post-Office Money Orders must be

made payable to E. Harrison Cawker.

Bills for advertising will be sent monthly, unless

otherwise agreed upon.

For estimates for advertising, address the UNITED

STATES MILLER AND THE MILLING ENGINEER.

[Entered at the Post Office at Milwaukee, Wis., as

mail matter of the second-class.]

MILWAUKEE, JULY, 1889.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER AND THE MILLING ENGINEER. You will thereby oblige not only this paper, but the advertiser.

WE send out a number of SAMPLE COPIES of this issue containing subscription blanks. We solicit a critical examination of our Journal and invite you to subscribe. The price is one dollar per year. No premiums—no discount. Our August number will contain matters of special interest to millers which you will not find elsewhere.

THE California wheat crop is estimated to be about 85,000,000 bushels.

CHICAGO can now boast of having a population of more than a million.

BAGGING, twine and paper combinations received imports of hemp and jute butts during the third week in June valued at \$1,225,000.

THE Chicago bucket shop men have beaten the Chicago Board of Trade in the legal struggle over the matter of furnishing quotations.

THE Minneapolis Chamber of Commerce is said to be involved in litigation over the title to the ground on which its elegant building stands.

THE New Era Exposition, St. Joseph, Mo., opens Sept. 3, and closes Oct. 5. Great efforts are being made to ensure its success. St. Joseph is a live town, and has great advantages, that will bear close investigation.

COL. GEORGE BAIN of St. Louis failed to secure the U. S. Consulship at Glasgow, greatly to the regret of his many friends. It is said, however, that he is on the list for a good position abroad. We hope he will be successful.

THE most thorough description of the Paris Exposition, for the information of practical men, that we have yet seen, is in the edition of *Engineering*, London, (W. H. Wiley of 15 Astor Place New York is the American agent.) The article with numerous illustration fills nearly a hundred pages.

AND now comes the *American Analyst* asserting that bread made from modern-milled flour is detrimental to good teeth for the reason that it does not contain the constituents necessary to nourish them. It also sounds loudly the praises of oatmeal, a commodity which is responsible for more dyspepsia and kindred ills than any other article of food we know of. If man lived by bread alone, there might possibly be something in the arguments of the *Analyst*, but he don't—especially when "Bulls" have got the market, and meat and vegetables are cheap.

IT is scarcely necessary to call the attention of our readers to the OPEN LETTER in this number, of the CONSOLIDATED ROLLER MILL Co., to the millers of this country. It is at this time an announcement pos-

essed of thrilling interest to a great many people, and will no doubt be read with careful attention from beginning to end. We are informed on the best of authority that some manufacturers of roller mills are negotiating with the CONSOLIDATED COMPANY for the privilege of manufacturing with license. What further steps in the line of defense will be taken, we do not know at this writing.

ELECTRICITY has come to stay and the public is not slow in recognizing the fact. The minds of thousands are to-day studying to what new uses to apply it, and to secure its use with the highest degree of economy. Its use thus far in flour mills has been almost entirely for light. In some mills a system of electric call bells are used and an electric flour tally arranged in connection with the flour packers has been invented. It indicates in the mill office every sack or barrel of flour packed and insures accurate weight. There is one flour mill in the West in which the power required to run it, is transmitted from the turbine wheel some half-mile distant. As improvements and new discoveries are made they will of course be adopted by millers as quickly as by any other class of manufacturers.

AT St. Louis the first new wheat-flour made from the crop of 1889, was exhibited on 'Change June 26 by the Geo. P. Plant Milling Co.—a sack each of "Sweet Home" patent and "Pilgrim" straight. It was examined by experts and pronounced fully up to an exceptionally high standard. The wheat was from the vicinity of Neodesha, Kas. On this subject the St. Louis *Post-Dispatch* says: The wheat, barring its toughness, which caused it to grade No. 3, was otherwise in fine condition and of excellent quality, speaking well for the Kansas crop. As usual with first arrivals, this car of new wheat was sold on call by auction, and the buyers were the Plant Milling Co., who paid \$1.04 per bushel. This milling concern has been running in St. Louis for nearly fifty years, celebrating their fiftieth anniversary next year, and they have bought, with very few exceptions, the first arrivals of new wheat in that market during all that period.

THE representatives of the Civil, Mining and Mechanical Engineering Societies are having a grand time on their European trip. They were welcomed, feasted, entertained and showed the engineering wonders of the United Kingdom by their British brethren and are now being put through their paces in Paris by the French engineers. The party are not only having lots of fun but are working hard in taking observations and in all human probability they will learn much that will soon be put into practical use in our own beloved country. We think this excursion will be of great benefit to all. There are many things to be learned by our engineers from their European brethren some of which will be well learned on this trip and when the European engineers visit us perhaps we can have the satisfaction of paying them off by showing them, a new thing or two.

CONGRESS approved an act, May 24, 1888, entitled: "An act authorizing the President of the United States to arrange a conference between the United States of America and the Republics of Mexico, Central and South America, Hayti, San Domingo and the Empire of Brazil."

This International American Congress will meet at Washington, D. C., Oct. 2, 1889. The object of the meeting is simply the discussion of certain large and important commercial and industrial questions which are of direct interest to this country in its relations with the other powers of the North and South American Continents. Secretary of State Blaine has issued circulars enclosing a

copy of the act, and has sent them to the important commercial organizations of this country, among them the Millers' National Association. Suggestions upon subjects referred to, are desired. The executive committee will consider the matter carefully at its next meeting.

THE announcement is made that Alex. H. Smith of St. Louis, has resigned his position as member of the Sub-Executive committee of the Miller's National Association which he has held uninterruptedly for a period of over ten years and also his office as secretary of the Central Millers' Association. Some remarks made by Mr. Smith while in Milwaukee last month no doubt indicated that he was considering some such step. He has expressed himself as feeling that he had done his share of the hard work during the many years past, and that there were other good men, who ought to go on with it. While many of the friends of the Association and of Mr. Smith must regret his relinquishment of active participation in the affairs of milling associations, they cannot deny that he has served long, vigorously and faithfully, and has now a warm place in the hearts of his fellow millers throughout the length and breadth of this broad land, and the knowledge that this is so, will we know, be all the reward he wishes for. May his days be long and his paths lead to pleasant places.

IT is said that once upon a time an old man lay dying and his parting advice to his son who stood beside him was in these words—"My son go forth into the world and seek your fortune. By all means, get money—honestly if you can—but—get money." Having given this counsel, he turned his face to the wall and was gathered to his fathers.

Verily the old man's advice has been taken by countless thousands of the sons of men, for the money-getting tendency of the times, the hot pursuit of the almighty dollar and the disposition to measure men and things by the money standard has become altogether too evident to men who think. But once in a while something happens that brings out the fact that the most eager men in the race for wealth are not so entirely bad as some would have us believe. Note the Johnstown disaster. It appealed directly to the finest instincts of human nature and money, food and clothing poured in, to relieve the distressed and bury the dead. For a time at least many men whose sole effort in this life seemed to be that of accumulating wealth have come promptly and liberally forward and played the part of the Good Samaritan.

We have always among us men and women who are liberal according to their means but the contributions from Boards of Trade, Stock Exchanges and similar organizations who too frequently are considered only as combinations of money-sharks have been so liberal that the most bitter cynic who bemoans the degeneracy of human nature, must pause, at least a moment and admit that there is some good left in it yet.

SPIKE CRITICISMS OF MACHINES.

IT is doubtful if there ever was or ever will be a machine of any kind so absolutely perfect that it cannot be improved in some detail or other by some one. Honest criticism is not only commendable but desirable for it tends to the perfection of a machine. On the other hand, when out of pure spite against the inventor, builder or seller of a certain machine, or line of machinery a person derides, ridicules, criticizes and unqualifiedly condemns it as worse than useless, we can scarcely conceal our contempt for his weakness—for a most pitiable weakness it is.

Many also claim it is business, on no less an authority than old Blackstone himself for a competitor in trade to say

all manner of fine things in favor of his own goods (he may even lie moderately in their interest) and to criticize his rivals product as long as he keeps within the range (often long range) of truth. *Caveat emptor* (let the buyer beware) is the law of trade, and it is the buyer's business to be on his guard. There are of course many business houses who would scorn to do any commercial lying about their goods but there are few of them but have commercial travelers who will tell the truth, decorated in the highest style of the art, if they think they can thereby make a trade.

HOW OFTEN SHOULD ROLLS BE DRESSED?

IN those "good old days," that some millers refer to, when flour was made by millstones, it was necessary to dress the stones often and to adjust them with the greatest care. If you look over the files of milling journals published a dozen years since, you will find much of the space devoted to articles and illustrations concerning stone dressing. If a miller was admitted to be a first-class millstone dresser, that alone was sufficient to guarantee him a good situation.

Then rolls came into the market and have been almost universally adopted in all mills making a pretense of doing fine work. One of the arguments used by sellers of roller mills was that all trouble about dressing would be done away with; that the rolls would not need dressing or recorrugating more than once in from two to five years and then it would be done by the mill furnisher at a trifling expense.

Experience has shown that rolls do not require dressing, (recorrugating or grinding) by any means as often as millstones, but it has shown that it requires a fine sense of perception to know just when a roll is worn enough to warrant the expense of redressing. It has frequently happened that mill owners have been persuaded to put in some special corrugation. After it was done and the mill started up the results were so much better than before that the special corrugation accepted was given the credit of the improvement. If the rolls had been simply recut to the original corrugation perhaps the result would have been just as good. The writer is of the opinion that it requires a miller just as observing to keep rolls in proper condition as it used to in those "good old days" to keep the millstones in order. We would like to hear from millers on this subject. It is worth not only consideration but careful experiments.

SECRETARY FRANK BARRY.

IN accordance with the resolution adopted by the Millers' National Association at the June meeting, a Secretary has been appointed, whose duty it is to devote his whole time and energy for the best interests of the Association. Mr. Frank Barry, of this city, has been appointed. Mr. Barry has filled a responsible position with Messrs. Edw. P. Allis & Co., for several years, and is certainly well posted in the mechanical part of the milling business. One of his chief duties while with this firm was the placing of advertising and doubtless at times some of the milling papers felt that they did not get their share (we acknowledge that we felt that way) but taking all things into consideration we think there was little just cause for complaint. He has also had considerable experience in railway service. As the travelling correspondent and agent of the *Northwestern Miller* he made a host of friends among millers and manufacturers in all parts of the country. He stands well socially; is a Mason of high degree, Chancellor Commander in the Order of Knights of Pythias and also a member of that *sumum bonum* of all secret and charitable organizations the Elks. He is also a member

CONTINUED ON PAGE 77.



An Open Letter to Millers

CONSOLIDATED ROLLER MILL CO.,
No. 52 Monroe Block, 204 Dearborn Street.

CHICAGO, ILL., June 6, 1889.

To the Millers of the United States:

We are the owners of a very large number of patents for various improvements in Roller Mills, among which we mention more particularly the following:

| | | | |
|----------------------|-------------|-----------------------|-------------|
| W. D. Gray..... | No. 222,895 | John Stevens..... | No. 230,834 |
| "..... | " 228,525 | "..... | " 236,104 |
| "..... | " 235,761 | "..... | " 236,643 |
| "..... | " 238,677 | "..... | " 240,252 |
| "..... | " 251,217 | "..... | " 252,705 |
| "..... | " 261,337 | "..... | " 268,567 |
| "..... | " 264,454 | "..... | " 304,468 |
| "..... | " 266,488 | U. H. Odell, Re-issue | " 10,139 |
| "..... | " 271,331 | "..... | " 260,225 |
| "..... | " 273,065 | "..... | " 260,226 |
| "..... | " 283,339 | "..... | " 260,705 |
| "..... | " 303,369 | "..... | " 264,559 |
| "..... | " 311,829 | "..... | " 306,945 |
| "..... | " 337,161 | "..... | " 339,927 |
| "..... | " 339,162 | D. W. Marmon..... | " 274,508 |
| "..... | " 339,163 | "..... | " 277,307 |
| "..... | " 339,164 | "..... | " 275,335 |
| F. Wegman, Re-issue | " 10,579 | "..... | " 276,440 |
| "..... | " 294,418 | "..... | " 281,707 |
| R. Birkholz..... | " 255,715 | Marmon & Warrington, | |
| "..... | " 257,647 | Re-issue | " 10,493 |
| H. Birkholz..... | " 269,623 | Marmon & Warrington, | " 266,490 |
| S. R. Campbell..... | " 247,301 | "..... | " 275,055 |
| Wescott & Karns..... | " 258,832 | "..... | " 277,525 |
| John Stevens..... | " 221,371 | "..... | " 305,320 |
| "..... | " 225,770 | | |

Besides a large number of less important patents, which need not be named in this connection.

You will observe at a glance that the above list contains all the patents of Gray, Odell, Stevens, Marmon and others, who are universally recognized as the leading Milling Engineers of this country, and who were the pioneers in the improvement and construction of modern Roller Mills.

We believe these patents effectually cover every valuable feature of the modern Roller Mill; and we doubt the possibility of building a successful Roller Mill—such a machine as the requirements of the trade demand—without infringing some of them.

Four of the leading Mill Furnishers of the country, viz.: E. P. Allis & Co., of Milwaukee, Wis.; Stilwell & Bierce Mfg. Co., of Dayton, Ohio; The John T. Noye Mfg. Co., of Buffalo, N. Y., and Nordyke & Marmon Co., of Indianapolis, Ind., recognizing the scope and strength of our combination of patents, and desiring to afford their customers absolute security in the use of their Roller Mills, have taken out licenses from us, but there remain a large number of unlicensed Mill Furnishers, who with an utter disregard of our rights have appropriated our inventions, and are manufacturing and selling Roller Mills which grossly infringe our patents.

We propose to establish and maintain our vested rights under these patents, and to that end have brought a number of suits in various Districts of the U. S. Circuit Court, some of which have been carried to a successful conclusion; others are still pending, and none of which have been decided against us.

The first of these suits we will refer to was brought by U. H. Odell *et al.*, against Stout, Mills & Temple in the U. S. Circuit Court for the Southern District of Ohio, before District Judge Sage, and Justice Matthews of the U. S. Supreme Court. The defendants manufactured the "Livingston Roller Mill," and the suit was for infringement of Odell's Re-issue Patent No. 10,139. The patent was sustained and the defendant's machine held to infringe it, and its manufacture discontinued.

The next case brought to a decision was that of The Consolidated Roller Mill Co. vs. The Miller Mfg. Co. *et al.*, in the U. S. Circuit Court for the Northern District of Ohio. The patents sued upon were the Gray Patents Nos. 222,895 and 238,677. The defendants entered an appearance in the case, and at first seemed confident of being able to make a successful defense, but subsequent and more thorough investigation convinced them of the hopelessness of their case, whereupon they admitted the validity of our patents and their infringement of the same, and consented to a decree and perpetual injunction against them, and retired from the business of making Roller Mills.

The next case to which we will now refer (and the one which has attracted the most attention, because five prominent manufacturers of Roller Mills are understood to have joined in the defense, which was most stubbornly, thoroughly and ably conducted) was that of The Consolidated Roller Mill Co. vs. Wm. A. Coombs in the U. S. Circuit Court for the Eastern District of Michigan. Mr. Coombs owns a mill at Coldwater, Mich., in which he was using the "Mawhood Roller Mill," manufactured by The Richmond City Mill Works, of Richmond, Ind., and suit was brought against him for infringement of the Gray Patent, No. 222,895, and two other patents of minor importance. It was evident there could be no escape from the charge of infringement provided the Gray Patent was sustained, hence a most vigorous, thorough and determined effort was made to break down his patent and have it declared invalid for the various reasons set up in the defense. We need not go into details, which are accessible to all who care to investigate, but will simply state that the Gray Patent No. 222,895, which relates to the most necessary and valuable adjustment in Roller Mills, and which we think is more generally infringed than any other, was *broadly and unequivocally sustained in each of its claims*, and the Mawhood machine was held to infringe the same, and a decree for an injunction and reference to a Master in usual form was granted. In discussing this question of infringement, after having passed upon the validity of the patent, the Court used the following language: "In short, we regard the defendant's entire machine as simply a rearrangement of the Gray combination, for the obvious purpose of an attempt to avoid his patent."

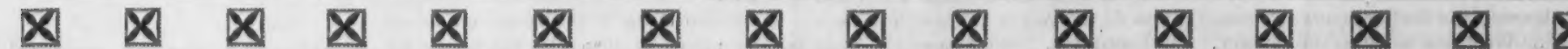
We have several other suits pending, which we shall push to a hearing at the earliest possible day.

We have not been fighting our battles in the newspapers, but in courts of competent jurisdiction, whose decisions must be respected; neither have we annoyed the millers with threats or proclamations of any sort, but having established our rights in the courts, we shall now compel a full recognition of them, and we feel confident that your sense of justice and fair dealing will approve of our course.

Millers purchasing or using Roller Mills that have been or may be hereafter licensed by us have nothing to fear in this connection, but all who purchase or use unlicensed infringing Roller Mills do so at their own proper peril.

Very Respectfully Submitted,

Consolidated Roller Mill Company



of the Milwaukee Commercial Club, and has an extensive acquaintance with leading business men in this and many other cities. Mr. Barry is a bachelor on the sunny side of forty, of pleasing address and courteous manners. His business abilities we believe to be first-class.

We have not made the foregoing somewhat complimentary remarks to please Mr. Barry or his friends, but as a chronicler of the things that the millers of the country want to know, and it is right that they should know all about a man whose duty it is to devote his undivided attention to their service. He will find his position no sinecure. More will be expected of him than it is possible for one man to accomplish, and there are perhaps as many kickers as pushers among millers as in any other trade. That he will work early and late, there is no doubt and we look for satisfactory results. We trust that the millers and the milling press will give him that encouragement and assistance which he needs to accomplish desired results. Remember that although he will have the advice and aid of the officers and executive committee, that whenever any patentee or anybody else wants to "hit a lick" at the Association, the devoted head of Mr. Secretary will be the first to receive the blow.

THE best advertised mill in this country is that Sullivan-Kilrain mill in Mississippi. By the way there are more people that know where Mississippi is, anyhow just now, than ever before. Can it be possible that Gov. Lowry has been working a shrewd advertising dodge to call attention to his state?

THE present great loss by fire to Seattle, W. T., will in the long run probably be a gain. It proved so, notably in the case of the great Chicago fire. The final result will no doubt be a better built and handsomer city. Outside capital having its attention drawn to the advantages of its location will not hesitate to invest with prospects of a good return for the use of their money.

THE regular weekly contributor to *The Mark Lane Express* (London) in a recent issue says:

I have read in an American newspaper of undoubted respectability and veracity, a statement that a cow in the township of Tecumseh, in South Simcoe, had recently given birth to two lambs and a calf. The story is told in all seriousness, and the farmer who owns the wonderful animal has made an affidavit that he was present when the lambs were born. The appearance of the lambs was followed by that of a calf. Brother Jonathan is accustomed to do things on a big scale, and it would really seem as if the peculiarity even extended to the lower creation.

We must protest against having any United States cow accused of such outrageous conduct, and at the same time beg the *Mark Lane Express* to study up its Colonial geography. The place named is in Canada, and we will undertake to guarantee that if the annexation scheme comes to a successful termination no such thing will happen in Bro. Jonathan's well regulated territory.

DOMINION MILLERS.

At the Convention of the Dominion Association, July 9, at Toronto, Ontario, a motion was carried providing that the Government be memorialized to assimilate the duty on flour with the United States duty on Canadian flour. It is desired that all flour imported into Canada shall be inspected by duly authorized flour inspectors, the market value of the flour when inspected to be the basis of value on which duty shall be collected, and in the event of the United States being willing to wipe out the duty on Canadian wheat and manufactured products thereof, the duty on American wheat and products to be dealt with in a similar manner.

It was also decided to urge all board of trade and corn exchanges in Ontario and Manitoba to assist the Association in obtaining these just concessions from the Dominion Government.

THE BRITISH SYNDICATE MEAN BUSINESS

SOME time since our London correspondent informed us that a syndicate of British capitalists were about prepared to take action with a view of buying American flour milling properties. It now develops that agents and accountants of this syndicate have been here for some time and are now fairly in the field for purchasing A No. 1 flour mills having an established and profitable business. This is evidenced by the following memorandum of information wanted, which has been sent to a number of millers in various parts of the country:

- 1st. An engraving or photo of the building, etc.
 - 2nd. Valuation of freehold land, etc.
 - 3rd. Valuation of buildings, machinery, etc.
 - 4th. Valuation of sundries, horses and vans, office furniture, etc.; and state how much working capital required to take over stocks of wheat or flour (as the case may be) that may be on hand.
- Valuation should be made and certified to as follows: Freeholds by some real estate agent of good standing and certified to by your town or county valuer. Buildings, machinery and plant, by some good authority on the same, and properly certified.
- Returns. Send returns for the last few years, that is, the quantity of barrels sold, giving gross profits, and deduct the working expenses and management only, in order to show the net profits as outlay on new buildings, machinery or plant, in order to extend the business, should not come out of the profits as that would be called "capital outlay," and such returns and profits should be properly certified.
- Be very exact with your figures, as they are sure to send a London accountant to verify all particulars.

It is evident that business is meant. There is a vast amount of capital lying idle in Great Britain, and the owners are looking anxiously for places to invest it profitably. The scheme seems to be to organize companies, purchase property and issue stock, a considerable portion of which is to be held by present owners and to place the business management in this country, in the hands of American owners. The general management in Great Britain will see to the sale of all exports to Europe. By this arrangement, citizens of each country will work for the mutual benefit of each other. When in full operation the product of a portion of or all the mills owned by the syndicate can be regulated as circumstances require. The Millers' National Association has been given full information in regard to this matter by the representatives of those seeking to make an investment of this nature, and owners of the right kind of milling property can, no doubt, secure any particulars not given above by writing to S. H. Seamans, Esq., treasurer of the Millers' National Association, of this city.

MILLING AND MECHANICAL NOTES.

(Condensed and compiled for the UNITED STATES MILLER AND MILLING ENGINEER.)

Don't be eternally tinkering about your engine, but *let well enough alone*. Don't forget that with a copper hammer you can drive a key just as well as with a steel one, and that *doesn't leave any marks*.

MILLERS will find it absolutely necessary to turn out good work, to pay close attention to the quality of their bolting cloths. Where a miller is not himself an expert his principal reliance must be on the honesty of the dealer supplying him.

Be careful when using a wrench on hexagonal nuts that it fits snugly, or the edges of the nut will soon become rounded. Be careful how you use a monkey wrench, for if it is not placed on the nut properly the strain will often bend or fracture the wrench.

THE hurried worker has often to do his work twice over, and even then it is seldom done in the best manner either for neatness or durability. It is the deliberate and measured expenditure of strength which invigorates the constitution and builds up the health.

MR. ENGINEER, the question why you are burning so much more coal this week than last, and why it takes so much more or less to run your plant than that of your neighbor, with about the same power, is one that you should lose no time in learning to answer correctly.

To calculate the number of shingles for a roof ascertain the number of square feet and multiply by 9, if 4 inches to weather, 8 for 4½ inches, and 7½ if 5 inches are exposed. The length of rafter of one-third pitch is equal to three-fifths of width of building adding projection.

THE benefits that have come to society and the world at large through the inventions and labors of the engineer are so numerous, and come so frequently and constantly, that they are received without one thought as to how they come, or the agency through which they are perfected and applied.

TREATMENT OF SMOKE-STACKS.—If before raising a new smoke-stack, each section as it comes from the shop, is coated with common coal tar, then filled up with light shavings, fired, and the chimney rolled slowly until the shavings are burned, it will resist rust for an indefinite period, rendering future painting unnecessary.

MANY a man has started to go around among shafting and belts in motion, to do oiling and necessary work, and has come back on a board, never able to tell how he lost his life—a bloody splash here, and a part of a limb there, reveals the place and cause of the accident. The poor fellow did not "watch out," hence the lifeless body that lies before us.

SCALE IN BOILERS.—One effect of faith in the various nostrums that are guaranteed to prevent scale in boilers is to beget carelessness, under the assumption that the use of the specific will make every thing safe. Some of these preparations may be excellent in their way, but none of them are universal in their application, any more than one drug is a cure for all diseases.

SECOND-HAND MACHINERY.—There are many lines or classes of goods in which second-hand articles may often be obtained, that are, to all intents and purposes, fully as good as new articles of the same kind; the simple fact of their having been used, largely depreciating their market value, though not injuring them in the least nor lessening their actual value for the purpose for which they were intended.

A GERMAN miller writes to *Mueller Zeitung* that he thinks that as the rising qualities of flour depend on its dextrin properties, flour which is deficient may be greatly improved by the mixture with it of 1 to 2 per cent. of powdered dextrin. He says that as dextrin in its development in the bread changes to a form of sugar, a mixture of powdered sugar will improve poor flour, though not to the same degree as will the dextrin.

PORCELAIN rolls will do work when used intelligently. The general tendency to overwork machinery has ruined more than one good machine. Porcelain rolls resent overwork more than iron rolls, and for this reason, when both were overworked, the porcelain roll was discarded and the iron retained. For fine dust middlings and other fine middlings porcelain rolls are particularly adapted, providing that they have enough surface. There should be two or three times as much as is given to other smooth rolls.

MUCH thought has been given to the devising of methods by which the power of running streams can be utilized. The latest device is that of M. Tain, a Russian engineer. His apparatus consists of an endless cable, carrying a series of canvas cones which open and shut like an umbrella. The cable passes over a double drum on board a pontoon, and at the other end over a pulley suspended from a buoy. On the lower part of the rope the cones are opened and forced forward by the current of water thus setting in motion a shaft or drum.

WIRE CLOTH.—The classification of wire cloth differs in different countries, but as a rule the small numbers denote the large, and the higher numbers the smaller sizes of the meshes. In Germany the number on the cloth gives the number of threads

found to the space of one Prussian inch; in Austria to one Viennese inch; in France and Switzerland, in one Parisian inch; in England and the United States, in one English inch. Consequently the numbers of the wire cloth bear the same proportion to each other as that of the length of the various inches; and are best illustrated by their reduction to the metric system. One inch English measure equals 25.40 m. m.; Prussian 26.15; Viennese 26.34; Parisian 27.07. The difference between the Prussian and Viennese measure is so small, that they can be accepted as the same for all practical purposes, and this generally forms the type for the classification of most of the wire cloth in use. Whether round wire is used or square wire, the numbers are the same. The shape is only of importance in the final application; for assorting and sifting of the grain, the round wire is preferred, but for cleaning purposes where friction is required, square wires have been found to do better service; their time of service, however, is short, as the sides of the wire, subject to constant friction, soon lose their sharp edge and become round.—*Oesterr.-Ungar. Mueller.*

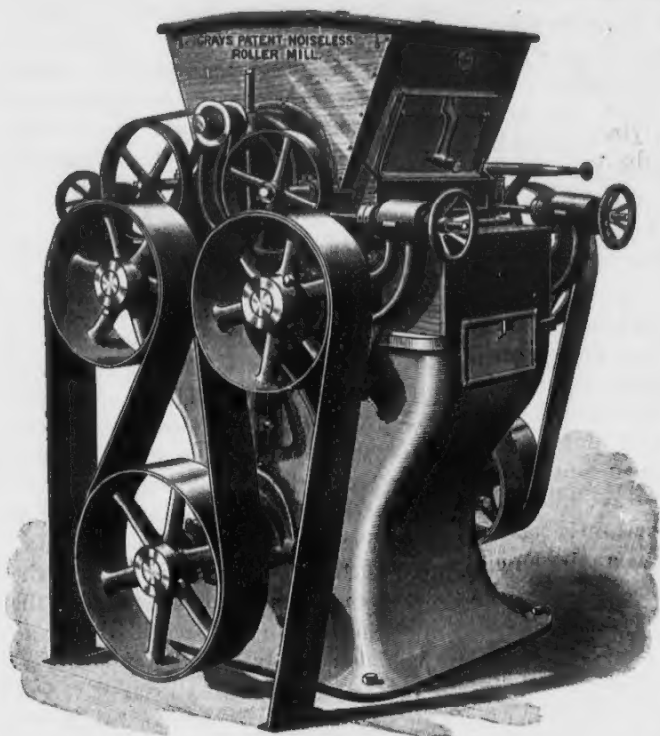
PARIS EXPOSITION.

THE exposition as a whole, is without doubt the grandest thing of the kind the world has ever seen. It enables a person to virtually go around the world in a few days; that is, to see the inhabitants of nearly every country, their dress, manners, houses, style of living, wares, manufactures, productions, amusements, and nearly everything to be seen in an extended travel except the natural scenery and climate. But the manifest purpose of the French government has been to make the Exposition one for the French nation and its colonies. They absorb a majority of the space and enjoy exceptional privileges. Other nations have had exhibits admitted merely in order to give the exposition the character of a world-wide affair. Most of the prizes and diplomas are being awarded to France and its colonies. The purpose evidently has been to create the impression that France is far and away ahead of all other nations. The United States exhibit is ridiculous for a country of its size, standing and resources. The fault lies with the government commissioners. Not one of them appeared at Paris two weeks before the Exposition opened. Before that they had only two or three clerks there, and they were hoodwinked and played right and left by the Frenchmen. The United States has no building there at all.

The Argentine Republic has a magnificent one and many nations having not one-tenth part of the importance of the United States have fine buildings and creditable exhibits. The United States exhibit is in the main building and occupies only about two-thirds of the space which Belgium has. Our government appropriated a quarter of a million dollars for the exhibit. I would not like to charge that any of the money had been dishonestly used, but I am free to say it has been most injudiciously expended. One of the first things the commissioners did was to rent a house for \$60,000 and settle down in it with their families. A great deal of money has been eaten up in salaries. The commissioners say a great deal of money was spent in collecting the display of cereals. It would not do a country fair, great credit. A little glass case six feet long holds all our wine exhibit. California alone wanted to appropriate \$50,000 for the exhibit of wine and fruit productions, but though I applied for space last January I was refused. The United States boasts of having more miles of railroad than all the rest of the world, yet the exhibit that line embraces here is one refrigerator car; the sawed off end of a freight car, and a little locomotive. France, England, Belgium, and even Switzerland make railway rolling stock exhibits which are incomparably better than ours, while Mexico and the South American countries throw the United States far in the shade with their exhibits.—*M. H. DeYoung.*



Mill Builders and Mill Furnishers



STANDARD MACHINE.

SPECIALTIES:

Gray's Noiseless Belt Roller Mill.

(Licensed by the Consolidated Roller Mill Co.)

Gray's Flour Dresser.

Gray's Centrifugal Reel.

Gray's Four-Roller Feed Mill.

The Reliance Purifier.

The Frank Beall Corrugation.

Complete Mills of any

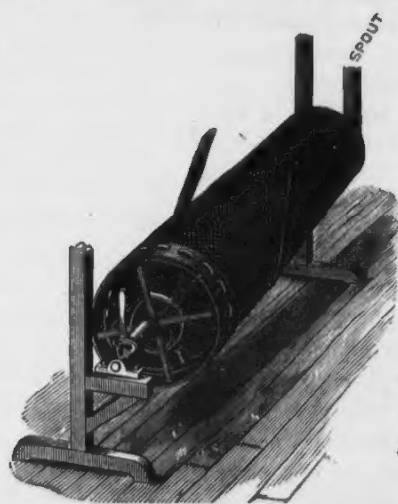
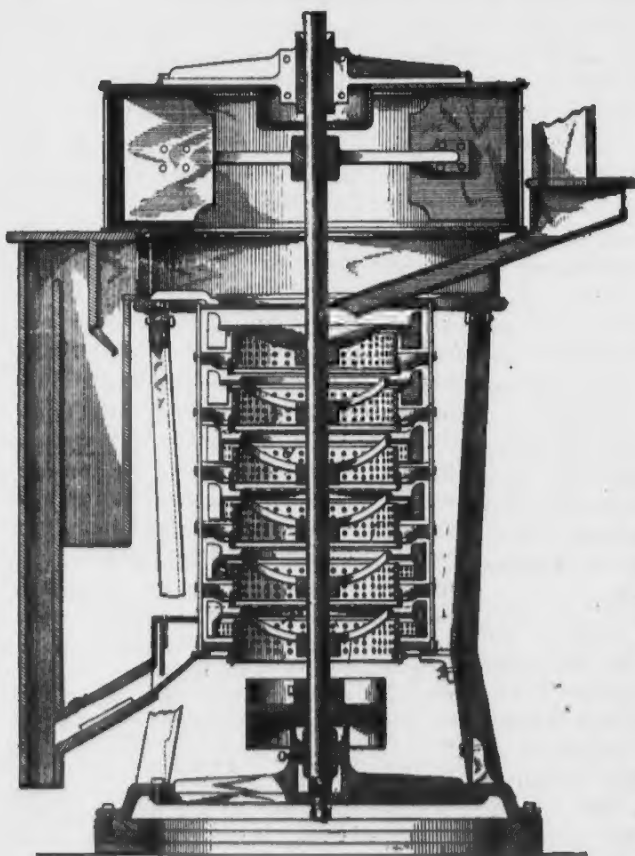
Capacity on the Allis System.

THE BEST OF THEIR KIND.

☞ Catalogue on application. If you want anything from a single machine to a complete mill, write us for prices and estimates. **IT WILL PAY YOU.**

THE GREATEST SUCCESS OF THE DAY!

✦ ✦ THE PRINZ GRAIN CLEANING MACHINERY. ✦ ✦



KIEL, Wis., January 21, 1889.

The Prinz & Rau Mfg. Co., Milwaukee, Wis.:

GENTLEMEN—The No. 2 Iron Prince Smutter which I bought of Mr. Prinz over two years ago has been very satisfactory to me, as it does the best work of any smutter that I ever saw work. It has caused me no trouble whatever, and if any person would like to see it run or know anything more about it, you may refer him to me.

Yours truly,

HENRY STOLL.

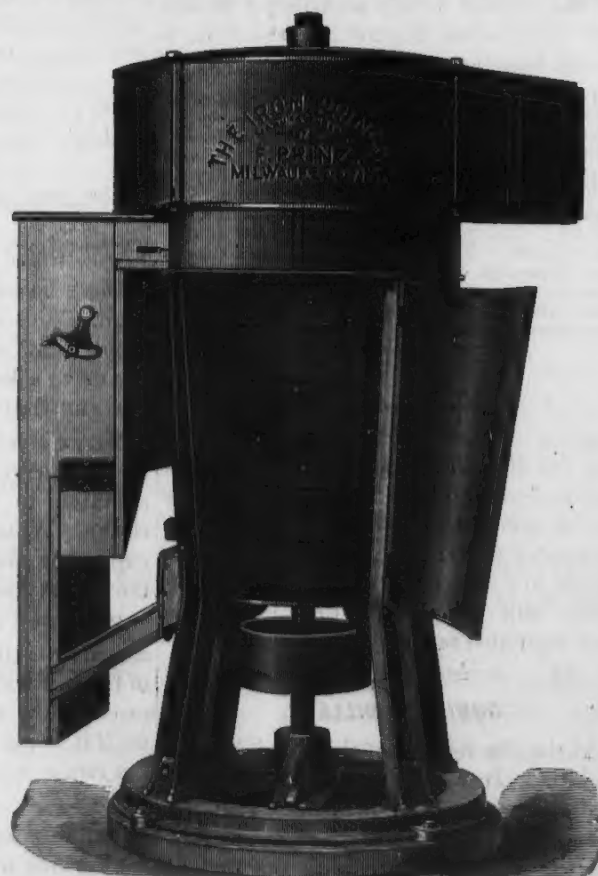
NEW TROY MILLS,
New Troy, Mich., May 20, 1889.

The Prinz & Rau Mfg. Co., Milwaukee, Wis.:

GENTLEMEN—We have had your cockle machine running for some time, and it certainly is a grand success, and here is your money for same. I am perfectly satisfied with it, and can highly recommend it to any one.

Yours respectfully,

F. H. MORLEY.



The Iron Prince and the Prinz Imp'd Cockle Machine

MANUFACTURED BY

THE PRINZ & RAU MFG. CO.,

MILWAUKEE, WIS.

Write for Catalogue and Discount.

By Charles H. Manning, Manchester, N. H.

SPECIAL STAMPERS OF SHEET METALS.

We do Stamping and Pressing of Sheet Metals for All Classes of Work. Also Tinning, Galvanizing & Japanning.

—ALSO SOLE MANUFACTURERS OF—

SEAMLESS STEEL BUCKETS

INSIST on having this Bucket furnished when ordering.

Ask your dealer for the Avery Pat. Seamless Steel Elev. Bucket.



We do not advertise Seamless Elevator Buckets and fill orders with "Pleced Ones"

We will make Special Prices rather than move stock to our new factory. Send for discounts.

THE AVERY STAMPING CO.,

—SUCCESSORS TO—

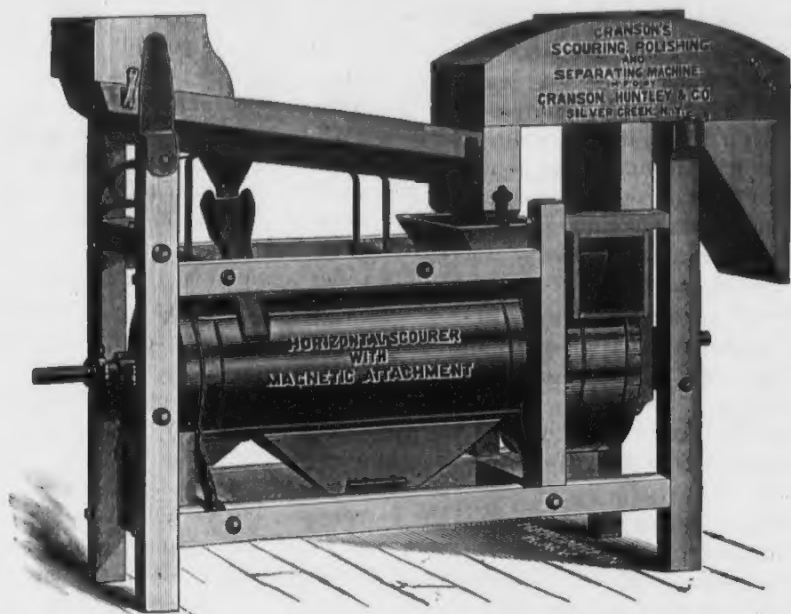
AVERY ELEVATOR BUCKET CO., CLEVELAND, OHIO, U. S. A.

THE CRANSON SCOURER

—IS ACKNOWLEDGED TO BE—

The Leading Scouring, Polishing and Separating Machine ON THE MARKET TO-DAY.

Two of these Machines are being placed to one of any other make.



WE ALSO HAVE THE BEST

Dustless Receiving and Elevator Separator

Ever Placed in any Mill.

✧ Write for Rock Bottom Prices and Full Information. ✧

—OUR HEADERS:—

CRANSON'S WHEAT SCOURER AND POLISHER, With Magnetic Attachment.
 CRANSON'S BUCKWHEAT SCOURER AND POLISHER, With Magnetic Attachment.
 CRANSON'S ROLLER BUCKWHEAT SHUCKER.
 MONITOR DUSTLESS RECEIVING AND ELEVATOR SEPARATOR.
 DIAMOND DUSTLESS CORN SHELLER AND SEPARATOR.
 DIAMOND CORN SHELLER.

Huntley, Cranson & Hammond,

Successors to CRANSON, HUNTLEY & CO.,

SILVER CREEK, NEW YORK.

The Best is Always the Cheapest.

—* THE CELEBRATED *—

DUFOUR BOLTING CLOTH

Is admitted by all millers to be the VERY BEST BOLTING CLOTH in the market, and so far ahead of any other brand that, as a matter of economy, they cannot afford to use inferior brands.

\$2,000 REWARD

Will be paid to any person who will furnish evidence to convict the unprincipled dealers who are selling poor and inferior cloths by representing them to be GENUINE DUFOUR.

R. P. CHARLES,

13 South William Street,

NEW YORK CITY.



The Link-Belt Machinery Co.

Are Prepared to Furnish Machinery and Appliances for

Transmission of Power

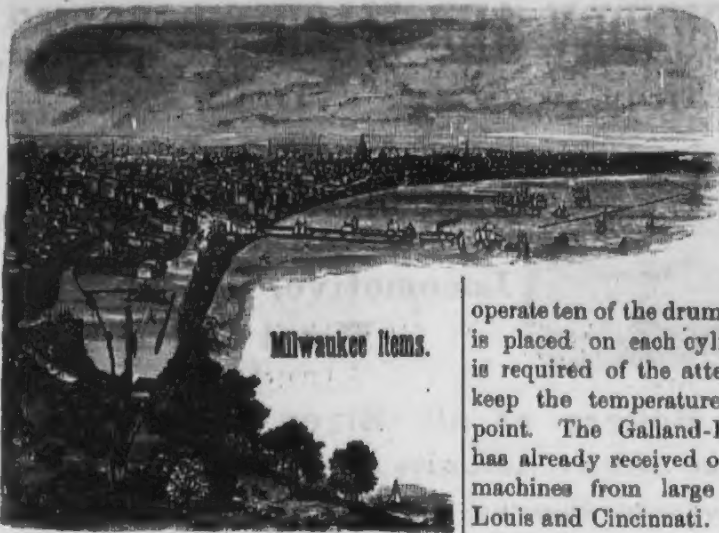
After the most approved Plans, by use of

MANILLA ROPE.

For Particulars and Estimates apply to them at

CHICAGO: 11 to 23 S. Jefferson St.**MINNEAPOLIS:** 200 to 202 Washington Ave. S.

SHAFTING
PULLEYS
HANGERS
GEARS.



Mr. G. N. BIERCE, of Dayton O., favored us with a call, July 1. He was on his way to Minneapolis for a brief visit.

Mr. KEFUS, commercial traveller for Huntley, Cranston & Co., Silver Creek, called on us. He reports business unusually good.

THE Wisconsin State Fair will be held in this city Sept. 17-21. The management expect it to excel in display all previous fairs in the history of the State. The premium list is liberal.

THE headquarters of the Wisconsin Millers National Insurance Co., J. W. Arndt, Sec'y, are now located in the New Insurance Building. This company is a favorite with Wisconsin Millers.

THE Milwaukee, Lake Shore and Western Railway made a semi-annual dividend of 3½ per cent., July 9. The statement presented shows a surplus of \$297,969 over all charges, from the last six months earnings.

MR. BEYNON, of Beynon & Murphy, Watertown, Wis., manufacturers of flour mill machinery, called on us recently. Mr. Beynon reports business at Watertown better this season than for a number of years.

THE first sale of new wheat was made in Milwaukee, July 9. It was sold by Mohr, Zinkeisen & Co., to the Daisy Roller Mills. It was Kansas wheat and was sold to arrive by sample. The price was 84 cents per bushel for ten car loads.

THE secretary of the Chamber of Commerce reports that the stock of flour in Milwaukee July, 1st at 53,000 bbls, of which 14,000 bbls were held by the mills and 39,000 bbls were in transit, a reduction of 8,000 bbls during June. A year ago the stock was 46,700 bbls.

THE traffic department of the Chicago, Milwaukee & St. Paul Railway is to be moved to Chicago, to be ready for business by September 1. The traffic includes both the freight and passenger departments, and it will take a share of officials and a large office force to Chicago.

GARDINER CAMPBELL & SONS are making an extensive addition to their foundry on Oregon street. When completed the building will have a frontage of 100 feet on Oregon street and will be three stories high. They have recently purchased the nickel plating business of Robert Whitehill.

ONE of the most important Mill building contracts of the season—the building of a 1500 barrel roller mill for William Listman, of La Crosse, Wis.—has been secured by Messrs. Edw. P. Allis & Co., of this city. The mill will be a model one in every respect. A Reynolds Corliss engine will drive the machinery. The contract will be executed as rapidly as possible.

THE Milwaukee Rotating Engine company is the name of a new corporation, incorporated June 13 by W. A. Myers, W. H. Upmeyer, H. Tischefer, W. H. Campbell, H. C. Munson and Julius M. Farmer, with a capital of \$750,000 and a large number of shares, each to cost \$50. The company will manufacture boilers, ma-

chines, etc., after a pattern invented and patented by J. M. Farmer.

THE pneumatic drum process will prove a great labor-saving method, one man being able to

operate ten of the drums. A thermometer is placed on each cylinder, and all that is required of the attendant is that he keep the temperature at the required point. The Galland-Henning company has already received orders for their new machines from large breweries in St. Louis and Cincinnati.

THE Fourth of July was an unlucky day for the Falk, Jung & Borchert Brewing Co. A fire originating in the malt-house destroyed the entire plant. The loss is estimated to be not far from a million dollars with an insurance covering about one-third of the loss. The Company will rebuild immediately. Arrangements have been made so that customers will be supplied with their usual quantity of beer until the new establishment is completed.

THE inside of B. Stern's "Jupiter Mills" looks as if an army of destroyers had marched through it—and so they have, but they were of a peaceful, skillful kind. In short—the inside of the mill has been completely "gutted" in order to make room for the new machinery now being put in, which it is intended will make the "Jupiter" the best 1000 barrel roller mill in the state. The work is being pushed with great rapidity, so as to enable the mill to start up again as soon as possible.

THERE is some talk of an electric light syndicate, which is composed of German and American capitalists, with a capital stock of \$20,000,000, locating a plant in Milwaukee for the manufacture of machinery. It is said to be the purpose of the syndicate to supply electric light at all principal cities in the country and to establish two chief centers, one in the East and the other in the West, for manufacturing the necessary machinery. A representative of the syndicate has been in the city looking over the ground during the past few days.

THE Edison Electric Light Co. of New York have concluded to locate their Western plant in Milwaukee and will commence work very soon. It is the purpose of the company to furnish the Edison incandescent light in the city and also to manufacture dynamos and electric motors. They have a large plant in successful operation at New York City and they intend to invest not less than \$500,000 in the Milwaukee establishment. The company has a capital of \$20,000,000 and among the principal stockholders are Thomas Alva Edison, the inventor; Henry Villard, Drexel, Morgan & Co., the New York bankers, and Dr. Siemens, a German capitalist.

AN instructive experience with a rat recently fell to the lot of a manufacturing firm in Milwaukee. Noticing that the bills for water delivered through the meter were unusually large, the managers ordered an investigation, and at last discovered that the lead supply pipe in one place ran in contact with a waste pipe, also of lead. A rat, who frequented the waste pipe, happening to be thirsty, and divining by the curious instinct peculiar to such animals, the proximity of a supply of water, had gnawed a hole through the walls of both pipes in order to get a drink. He succeeded in getting his drink, but omitted to close the hole again, and the water continued to flow through the meter and out again through the waste pipe, until the investigation revealed what had been done. Commenting upon the incident, the *American Architect* remarks: "Possibly some architect, who has had experience with

rats, may do the profession the service of writing an essay on the subject of catching them as well as preventing them from doing mischief. We have heard it said recently that a rat will not gnaw a hemlock board, and that a grain bin in a stable, if made of hemlock, or lined with it, is as safe against rats as if it were lined with galvanized iron. Whether this is so we cannot say, but some one ought to know about the matter, and if that person will come forward with his information he will deserve the thanks of the building community."

THE Galland-Henning Pneumatic Drum Maltng company has been organized with a capital stock of \$250,000. The company will build a factory in Milwaukee and manufacture the machines to be used for the new method of malting. Kraus, Merkel & Co., a large local malting concern, will control a majority of the stock of the company, and ex-Congressman Henry Smith will be superintendent of the works. The new method of malting has been in successful operation in the malt houses of Kraus, Merkel & Co., on South Water street, for the past three months. The process was invented in Germany, and the malting drums used by the firm were purchased there for \$38,000, upon which the revenue amounted to \$19,000. Owing to the expense of importing the machines, a company was formed, which will have the sole privilege of manufacturing the machinery in this country. The most important feature of the new process is that by its use malt can be made during the entire year, which could not be done by the old method. The old process was to place the malt upon large floors and allow it to "grow," being turned at intervals to prevent it from becoming too warm, thus spoiling. By the pneumatic drum process, the malt is placed in large cylinders or drums, which revolve with a slow movement. It effects a saving of four-fifths of the room used for malting by the old method, and cheapens the cost of production considerably. By the old way it cost 10 cents per bushel to manufacture malt, while the new process reduces the cost to 5 cents and a fraction per bushel. After the new method will have been in operation for some time, it is believed that the expenses per bushel will be reduced to 4½ cents.

TRADE NOTES.

THE Western Agency of Huntley, Cranston & Hammond is well represented by B. F. Ryer, of 66 S. Canal St., Chicago, Ill. Mr. Ryer is also the general agent for Hueffners' Roll Corrugation which is meeting with considerable success and is making new friends daily.

CONSUMERS of lubricating oils desiring to secure positively reliable grades of oil, will do well to correspond with the VACUUM OIL Co., Rochester, N. Y. Ask them to send you a copy of their "Pamphlet on Lubrication." It is instructive and will be sent free to those writing for it.

IT is evident that "The One-horse Shay" manufactured by THE ONE-HORSE SHAY Co., of Sterling, Ill., is filling a long-felt want. We can personally testify that this shay is a good, well-built and easy-riding conveyance, and the price, (\$15.00) is certainly within the reach of almost anybody. The seat is wide enough for two persons of ordinary size. See advertisement.

THE STILWELL & BIERCE Manufacturing Co., Dayton, O., have just made a shipment of 11 car loads of Victor turbines and other machinery to the Kimberly & Clarke Co., of Neenah, Wis., for their large new pulp and paper mill at the "Cedars," and five car loads are yet to follow. This is believed to be the largest shipment of water wheels ever made at one time to one concern.

THE C. C. Washburn Flouring Mill Co., Minneapolis Minn., have just ordered of Messrs. Edw. P. Allis & Co., of Milwaukee, 55 double 9x24 Gray roller machines,

a number of Reliance purifiers, and other machinery. Several other heavy orders have also been booked during the past month. The engine department is driven to full capacity, and the works are run both day and night.

THE mammoth sugar refinery of Claus Speckels, of Philadelphia, is being equipped with its apparatus. The steam plant consists of thirty Babcock & Wilcox boilers, which are located on the first and second floors of the building. Each boiler is fired by a pair of Roney Mechanical Stokers, making sixty stokers in all. The Stoker plant, together with the complete coal conveying apparatus, is put in by Westinghouse, Church, Kerr & Co., of New York, and is so arranged that the coal is handled mechanically, and without manual labor of any kind from the time the car of coal is dumped until the ashes are shot into the ash vault. Mr. Speckels has thus far contracted for 31 Westinghouse Engines as a part of the power plant. Fifteen of these engines, each of sixty-horse power, are for driving the centrifugal dryers; each engine being coupled direct to its own dryer, dispensing altogether with line shafting. The investigations on the part of Mr. Speckels together with his architect and engineer, which led up to this arrangement, were unusually interesting and complete. An entire set of apparatus was shipped to the Westinghouse Machine Co., at Pittsburgh, together with a supply of the raw sugar, and the necessary workmen. The plant, including the engine, was duly erected, and the processes gone through with and sugar refined on the spot. The power required and cost of same, was thus carefully ascertained, and the order for engines placed accordingly.

NEW OAT RULES ADOPTED.

At a meeting of the New York Produce Exchange, June 26, action was taken relative to the establishment of grades for clipped oats. The grades submitted by the committee on grain, to take effect on and after July 15, 1889, were fully considered and a number of amendments were offered and adopted. The rules as they now stand are:

Extra white clipped oats shall be bright, sound, plump, well cleaned and reasonably free from all other grain, weighing not less than 38 lbs. to the measured bushel.

No. 1 white clipped oats shall be bright, sound, well cleaned and reasonably free from other grain, weighing not less than 36 lbs. to the measured bushel.

Oats that otherwise would grade extra white clipped and No. 1 white clipped, shall not be deprived of the grade if but slightly stained.

No. 2 white clipped oats shall be reasonably sound, well cleaned and reasonably free from other grain, but may be stained, weighing not less than 34 lbs. to the measured bushel.

No. 3 white clipped oats shall be mainly white, reasonably sound, reasonably clean and reasonably free from other grain, weighing not less than 30 lbs. to the measured bushel.

ROTARY BAG MACHINE.

The combination American clock-bottomed bag machine, will make 120 bags a minute. It works from thin or thick paper, and can be adjusted to make different sizes. The machine is simple in construction, and requires very little power to run it. The pasting and folding are completed automatically. There are but few working parts, all of which are of rotary motions. After the bags leave the machine they pass over a drying cylinder of six feet diameter, which can be heated either by steam or gas, and then the bags are picked up in the space between the machine and cylinder by girls. The bags are carried over the cylinder by means of a felt. The paper is obtained from the mill in rolls of the required width.

FOR RENT. A 2 run, water power, custom flour mill and dwelling house, containing 9 rooms, with 12 acres of land. Everything in good condition. Situated 8 miles north of Milwaukee City, Wis. Easy terms and a bargain. For full particulars address M. T. WALTON, 145 5th Street, MILWAUKEE, WIS.



PERFORATED SHEET METALS

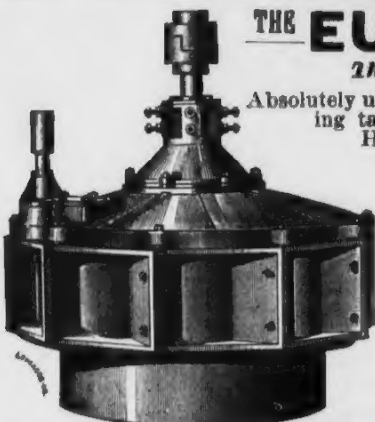
FOR ALL KINDS OF
GRAIN CLEANING MACHINERY

Used in Elevators, Warehouses, Flour and Rice Mills, Cotton and Linseed Oil Mills, Etc., Etc., Etc.

ROLLING SCREENS—ROUND AND HEXAGON.

Iron and Zinc for Rolling Screens, Corn Screens, Grain Dryers, Perforated Floors for Kilns used in drying Oats, Corn, Fruit, etc. Smut Mill Jackets of all kinds and sizes made to order. We will RENEW YOUR SIEVES for Out Separators, Receiving Riddles, Corn Screens, etc., at short notice.

THE HARRINGTON & KING PERFORATING CO.,
Nos. 224 & 226 North Union St., CHICAGO.



THE EUREKA TURBINE.

The Best Part-Gate Wheel Ever Built.

Absolutely unequalled in efficiency, is shown by the accompanying table from the records of actual tests at the HOLYOKE, MASS., TESTING FLUME.

PERCENTAGE OF EFFICIENCY.

| | Full Gate. | 3/4 Water. | 1/2 Water. | 1/4 Water. |
|----------------|------------|------------|------------|------------|
| 24" Wheel..... | .8456 | .8416 | .8808 | .8002 |
| 24" Wheel..... | .8906 | .7910 | .7700 | .7003 |
| 24" Wheel..... | .8078 | .7578 | .7275 | .6796 |
| 34" Wheel..... | .8000 | .8011 | .7814 | .6850 |

No other turbine ever approached the above figures at part-gate. We publish our part-gate figures. Others significantly omit them.

For Catalogue and information, address

The Allentown Foundry & Machine Co.,
ALLENTOWN, PA., U. S. A.



BASS FOUNDRY AND MACHINE WORKS,

FORT WAYNE, INDIANA.

—MANUFACTURERS OF—

First Class Steam Boilers,

INCLUDING

Locomotive, Upright,

Flued and Tubular

—AND—

Portable Boilers of all Sizes and Styles.

TWO SHEET BOILERS A SPECIALTY.

Contracts taken for Complete Power Plants.

Prices furnished on Application.

Hughes Bros. Steam Pump Co.,
CLEVELAND, OHIO.

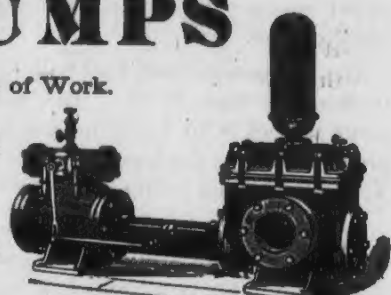
Builders of Single and Duplex

STEAM * PUMPS

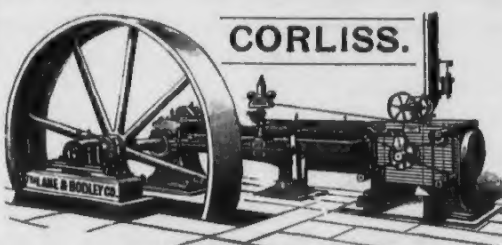
Of Every Description for all kinds of Work.

Satisfaction Guaranteed.

Send for 1888 Catalogue.



THE LANE & BODLEY CO.,



CORLISS.

MANUFACTURERS OF

AUTOMATIC CUT-OFF

ENGINES

From Heavy Patterns and of Unexcelled Workmanship.

Steel Boilers, Feed Water Heaters, Shafting, Pulleys and Gearing.

THE LANE & BODLEY CO., Cor. John & Water Sts., CINCINNATI, O.

* EVERY * MILLER *

Whether using Water or Steam Power, who wants

To Save His Machinery

And reduce the cost of running expenses, should have a copy of a Pamphlet on Lubrication, which will be SENT FREE on application to

VACUUM OIL CO., ROCHESTER, N. Y.

MANUFACTURERS OF HIGH-GRADE OILS.

Branch Offices and Warehouses in all the Leading Cities.

NEW YORK BELTING & PACKING CO.

JOHN H. CHEEVER, Treasurer.

15 PARK ROW, NEW YORK.

Oldest and Largest Manufacturers in the U. S. A. of

Vulcanized Rubber Fabrics for Mechanical Purposes

MILLERS' HOSE A SPECIALTY.

Also a Good STEAM HOSE.

RUBBER MATS,

RUBBER MATTING,

and STAIR TREADS.

RUBBER BELTING, PACKING AND HOSE.



SALESROOMS: PHILADELPHIA, 308 Chestnut St.; BOSTON, 59 Summer St.; CHICAGO, 151 Lake St.; ST. LOUIS, 907-911 N. Main St.; DENVER, 1601-1611 17th St.; CHARLESTON, 160 Meeting St.; MINNEAPOLIS, 88 South 2d St.; CINCINNATI, 161-165 W. Pearl St.; ATLANTA, 16 Decatur St.; DETROIT, 16-24 Woodward Ave.; BALTIMORE, 18 N. Charles St.; BUFFALO, 124-128 Washington St.; NEW ORLEANS, 54 Canal St.; KANSAS CITY, 2311-2313 W. 12th St.; RICHMOND, 1506 East Main St.; European Branch, HAMBURG, GER., Pickhuben 5, (Freihafengebiet).

Improved + Walsh + Double + Turbine



This wheel has a perfect fitting cylinder gate and draft tube combined, and allows no water to escape when closed.

POWER GUARANTEED

equal to any wheel on the market using equal amount of water. Address for particulars,

E. H. & J. SANFORD,

Phoenix Iron Works,

Sheboygan Falls, Wis.

IMPROVED CORN SHELTER,

IT IS THE
BEST CORN SHELTER
MADE FOR MILL USE.

IT IS
Simple in Construction
Almost Noiseless,
—AND—
Requires Little Power

HUNDREDS ARE IN USE.

For descriptive circular, price list, etc., Address

JACOB VALENTINE,

Gorham, Ontario Co., N. Y.

"TRIUMPH" CORN SHELTER

CAPACITY
5000 BUSHELS PER DAY.
Shells wet or dry corn.
CHEAPEST AND BEST SHELTER.

PAIGE MFG. CO.,

No. 13 Fourth St., Painesville, O.

(Please mention this paper when you write to us.)

COMPOUND Condensing or Non-Condensing.
16 SIZES, 5 to 500 H. P.
Not yet equalled by any form of Engine for
HIGH FUEL DUTY AND SIMPLICITY.

STANDARD 13 Sizes in Stock.
5 to 250 H. P.
3000 in use in all parts of the Civilized World.

JUNIOR 6 Sizes in Stock.
5 to 50 H. P.
An Automatic Engine cheaper than a Slide Valve.
Well Built. Economical. Reliable.
Over 300 Sold the First Year.

All the above built strictly to Gauge with
INTERCHANGEABLE PARTS.
REPAIRS CARRIED IN STOCK.
SEND FOR ILLUSTRATED CATALOGUES.

**WESTINGHOUSE
ENGINES**
The Westinghouse Machine Co.
PITTSBURGH, PA. U.S.A.

SELLING DEPARTMENT IN THE
UNITED STATES.

New York, 67 Cortlandt St. } Westinghouse,
Boston, Hathaway Building, } Church, Kerr
Pittsburgh, Westinghouse Building, } & Co.
Chicago, 150 Lake St.
Philadelphia, 600 Chestnut St. W. E. McKie, Jr. & Co.
St. Louis, 300, 304 Washington Av.
Kansas City, 313 Union Avenue, } Fairbanks
Denver, 1200 Seventeenth St. } & Co.
Omaha, 1619 Capital Avenue, V. C. Ayer.
Pine Bluff, Ark. } Geo. H. Miller & Sons.
Salt Lake City, 250 E. Main St. } Fish & Newman
Butte, Mont. } a. Gamble St. } Machinery Co.
San Francisco, 21, 23 Fremont Street, Parks & Lacy Co.
Portland, Or. 35, 37 Front St. Parks & Lacy Mch. Co.
Charlotte, N. C. 10 College St. } The R. A. Tompkins Co.
Atlanta, Ga. 45 E. Prior St. }
Dallas, Tex. } Keating Imp. & Machine Co.
Chattanooga, Tenn. } C. L. James & Co.

NEWS.—A PULP and paper mill to be erected soon at Sault St. Marie, Michigan, and efforts are being made to secure a big flour mill.

ST. JAMES, Minn., offers a bonus of \$2,000 for a flour mill.

THE Liberty Park Roller Mill Co., Salt Lake, Utah, has incorporated.

THE mills of Benshoff & Co. at Johnstown, Pa., were destroyed by the flood.

AT Papillion, Neb., June 23, Clark's grain elevator was burned. Loss, \$20,000.

NELS ENGL is about ready to start up his new 75 barrel mill at Atwater, Minn.

THE Water Roller Mill Co., Liberty, Tenn., will build a \$7,000 roller mill this year.

W. H. King of Bowman, Ga. will rebuild his flour mill, which was lately burned.

BURNED—An elevator at Boissevain, Man., owned by Ogilvie Mill Co. Loss \$20,000.

THE Diamond Roller Mill at Lake Crystal, Minn., was entirely destroyed by fire July 11. Loss \$15,000; no insurance.

O. T. BUGBEE of Canewango Valley, N. Y., and W. H. King of Bowman, Ga., will rebuild their mills this year.

J. M. CAIN has bought the old mill of Bowman & Kellogg at Atchison Kas., and will convert it into a corn meal mill.

AT Greentown, Ohio, June 22, John Baker's flouring mill was burned to the ground, causing a loss of \$7,000; no insurance.

LEACH & BOWEN have leased the McLeran mill at Portland, Ore., and after giving it a thorough overhauling will start up.

TALMADGE BROS. are about to erect a corn-mill at Athens, Ga., with a capacity for grinding 1,500 bushels of corn per day.

THE rice mills at Goldsboro, N. C., have been sold to B. Jones, who is organizing a company with a capital of \$250,000 to operate the same.

THE J. B. Alfree Co. have taken a contract for a 75 bbl. mill from The New Sharon Mill Co., New Sharon, Ia., including an Alfree Automatic engine, etc., etc.

AT Menasha, Wis., June 27, an incendiary fire destroyed the old unoccupied flour mill, near the Government locks, owned by Wm. Smith. Loss, \$2,600; insured.

BURNED—June 20, S. Hommerburg's feed mill at La Crosse, Wis. Loss \$2,500. Insurance \$1,000. Spark from locomotive supposed to have caused the fire.

NEAR Bristar, Ark., June 8, the saw mill, cotton gin and flouring mill, owned by W. S. Holland, were burned to the ground. Origin of the fire unknown. Loss, \$5,500; no insurance.

AT Elmira, N. Y., June 15, the Centre Mills were struck by lightning and a grist and flour mill, a barn and a large quantity of lumber were burned. Loss estimated at about \$15,000.

BURNED—June 28, H. B. Groff's mill at Lancaster, Pa. It was operated by his son, E. F. Groff. Loss on mill, \$25,000. Insurance, \$17,500. Loss on stock, \$7,000; insurance, \$5,000.

THE J. B. Alfree Co. has sold special corn meal milling machinery, including the Keystone 4 High Corn Mill to Noel Bros., Indianapolis, Louis Kamp, Mount Carmel, Ill., and Sprague, Cratty & McKernan, Ostrander, Ohio.

THE J. B. Alfree Co., Indianapolis, Ind., have taken a contract for a 70 bbl. mill from Weaver, Miller & Co, North Grove, Ind., into which will be placed an Alfree Automatic engine, as well as an entire outfit of their machinery.

A WEBB CITY, ILL., miller has instituted proceedings against the Peoria, Evansville & Decatur Railroad company before the interstate committee, charging discrimination in rates in favor of E. P. Heilman, vice-president of the company.

A REPORT on the industrial development of the south the first six months of 1886, shows total number of new enterprises organized to be 2,615, representing \$108,838,000 of capital, as against 2,023 new enterprises, investing \$81,501,000 in the first six months of 1885.

MILTON B. ESHELMANN, flour mill at Newport, Pa., who recently made an assignment, continues the business for the assignee. His liabilities are about \$12,000; preferred claims, \$10,000; nominal assets, \$12,000. His loss by the flood was reported to be about \$1,000.

The grain elevator owned by Thomas Robb at Wadena, Minn., was entirely consumed by fire June 20th, with 3,500 bushels of wheat. The building was worth \$5,000, insured as follows: Phoenix, \$1,000; National, \$1,000; St. Paul Fire and Marine, \$1,000. The wheat was owned by F. W. Murray, and was insured for \$3,500.

THE Reliance Gauge Company, of Cleveland, O., recently received its fourth order

from the Meriden Britannia Company of Meriden, Conn., for Reliance Safety Water Columns. The Meriden Co. first tried these Columns about two years ago. These repeated orders are unquestionable testimonials of the merit of the goods.

SEPTEMBER 1 the Washburn-Martin company, the owners and operators of the big mills in Minneapolis, goes out of existence and will be succeeded by the Washburn-Crosby company, just organized. The principal change is the entire withdrawal from the business of Senator W. D. Washburn. The new company has a capital of \$500,000. The members are John Washburn and John Crosby, now a student in Yale college.

A CURIOUS mixture of industries at one establishment is reported from Kansas. A \$100,000 mill, for the manufacture of sugar, salt and paper, is now being built at Arkalon, in that State. For three months it will make sugar from sorghum, then work up the cane chips into paper, and the rest of the time turn out salt. To encourage sorghum sugar making the Kansas Legislature has exempted all sugar plants from taxation until 1895.

THE Reliance Gauge Co., of Cleveland, O., is making quite a good many water columns of finished brass, for establishments which believe in equipping the boiler room, as well as the engine room, in first class shape. Among the recent orders for these, is one from the Overman Wheel Co., of Boston, whose plant at Chicopee Falls, Mass., will be an exceptionally fine one. The columns are 30 inches long and 6 inches in diameter at the bosses, and are of the combined high and low water alarm pattern, with the alarm lines 8 inches apart. They are duplicates of the largest finished brass column exhibited at the Chicago Electrical Exhibition, and will be put up in pairs between the boilers, giving an exceptionally fine appearance.

NEW MILLS.—C. J. Peffer of Lebanon, Ill., has completed his 200 barrel roller mill. W. J. Meyer & Bro. are building a 100 barrel mill at Troy, Tenn. and expect to have it ready for operation by August 1. J. C. Carroll & Co., Adairville, Ky., whose mill was recently burned are rebuilding. J. A. Knight & Son are building a saw and grist mill at Sylacauga, Ala. The Farmers' Mutual Benefit Association Milling Co. has been incorporated at Nashville, Ill., with a capital stock of \$12,500. The Eureka Flouring Mill Co. has been organized at La Otto, Ind. with a capital stock of \$8,000. The directors are W. L. Wood, Hiram Gowell and E. A. Dittman. A 50 barrel flour mill will be built at Sharon Springs, Kan. N. Engel is building a 75 barrel mill at Atwater, Minn. A stock company is being formed at Statesville, N. C. with a capital of \$8,000 to build and operate a flour mill. Wm. Youngblood will build a new roller flour mill at Liberty, Tenn. O. T. Bugbee of Canewango Valley, N. Y. whose mill was recently burned will rebuild.

THE following dispatch from Belleville, Ill., under dated of June 12, refers to a quite well-known character in milling circles: "A queer romance developed here to-day upon the receipt of a telegram from New York charging that Anton Schwarzwelder, a well-known inventor of this city, had been made a defendant in New York in a criminal prosecution for bigamy. He left Belleville for Europe last December for the purpose of collecting \$250,000, which he told his wife he had inherited in Bavaria. While abroad he met a Miss Stark, whom, it is alleged, he married. They returned here two weeks ago, and Schwarzwelder told his legal wife that he was compelled to marry the woman in order to get the money, which by the way he has not yet collected. He kept the two wives together for a week, and then left for New York with his new acquisition, leaving his legal wife and children here. The Belleville wife says that her husband, who, she asserts, is a German count, was compelled to commit bigamy to secure the fortune. His grandmother controlled the money and vowed to disinherit him unless he married according to her wishes. Schwarzwelder either proposes to have his first wife procure a divorce and pay her liberally from his fortune if he secures it, or he has deliberately used the second wife, who is said to be the daughter of a wealthy manufacturer of Munich, to further his scheme.



ITEMS FROM BEYOND SEAS.

THE flouring mills of Budapest, Austria-Hungary, produced 6,860,633 barrels of flour during the year 1885.

It may not be generally known," says a writer in *Engineering*, (London), "but it

is a fact that the U. S. Government has the finest torpedo service in the world, and any hostile fleet that may presume on the apparently unprotected condition of its harbors, will doubtless bear full testimony to the truth of the foregoing statement."

THE condensing effect of electricity upon steam has just been demonstrated by Prof. Sorket, the electrician, at Genoa. In a darkened room he heated some water in a platina basin which was connected with an electric machine. Just above the surface of the water was fixed the other pole of the electric stream which passed through the platina and the water. An arc lamp made steam visible as it rose from the heated water. As soon as the machine was set to work the steam was observed to fall down upon the edge of the platina basin and there condense itself, instead of rising as usual. When the point was brought quite close to the surface of the water the generation of steam was completely stopped, although the water continued to boil.

HUNGARIAN FOOD.—A recent British Consular report from Buda Pesth, refers to a publication by the Hungarian Statistical Bureau on the food of the Hungarian people. Green food, vegetables and millet seem to form about one-fourth of their food and potatoes one-fifth. The peasantry in some parts eat bread only on Sundays or festivals; otherwise they eat a kind of cake made of rye, barley or maize meal, mixed with milk, but the chief article of food is the potato. Thus it happens that Hungary exports a large proportion of her wheat produce; for instance, while last year's total wheat crop was 137,600,000 bushels, no less than 51,648,000 bushels in wheat and flour were exported to Austria and abroad, or nearly 40 per cent. of the total produce. Russia too is a small wheaten-bread eating country; her crop last year was 246,240,000 bushels and 106,000,000 bushels, or 43 per cent. were exported in the 12 months ended December 31, 1885.

THE PARIS EXHIBITION.—The only English exhibitors in the Milling Section are Messrs. T. Robinson & Son, Lim., Rochdale, with a complete model flour mill; Messrs. J. Sloan & Co., with a full line of Turner's machinery; and Mr. J. H. Carter. Germany is represented solely by Messrs. Seck Bros., Darmstadt; whilst the American milling engineers there are represented by the Geo. T. Smith Middlings Purifier Co.; Mr. S. Howes of Silver Creek, with a full line of his wheat cleaning machinery; and Mr. Aug. Heine, of Silver Creek. Amongst the Swiss milling engineers there are Mr. Daverio, Messrs. Escher, Wyss & Co., Mr. M. A. Millott, and Mr. F. Wegman, of Zurich; besides, of course, the numerous Swiss bolting silk manufacturers, who exhibit samples of their specialties. The French milling and baking engineers are to the fore with a great variety of appliances most of which are old to English millers.

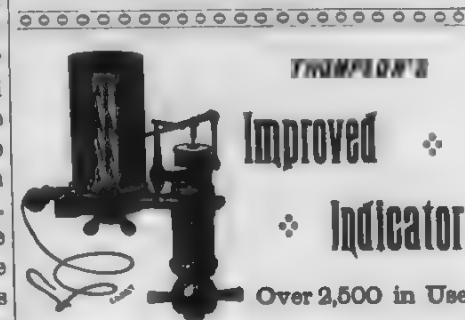
THE *Electrical Review*, London, concludes a long technical article on "Electricity Produced by Wind Power," as follows: "There are three serious objections to the use of windmills for driving dynamos. In the first place, there are the periods of calm, during which no movement of wind appears to take place; in the second place, the irregular velocity of the wind; and, in the third place, the imperfect construction of the receivers or windmills. It is quite manifest that the first objection is insurmountable. The second has been partly overcome by the employment of an automatic apparatus, which opens or closes the sails according to the velocity of the wind. But how far such an arrangement could be used on a large scale we will not venture to predict. The last objection is, doubtless, one which might be surmounted; but the impossibility of overcoming the first objection, and the indefiniteness of the second, are sufficient proofs to show that the wind will never be used on an

American Steam Gauge Co.,

—SOLE MANUFACTURERS—

Bourdon Steam Gauges,

WITH LANE'S IMPROVEMENT.



American Pop Safety Valves,

For Locomotive, Stationary and Portable Boilers, and Instruments incidental to the use of Steam. Send for Price List I.

36 Chardon St., BOSTON, MASS.

Send for Catalogue K.

extensive scale for motive-purposes, and especially as regards electric lighting.

ELECTRIC-POWER TRANSMISSION IN EUROPE.—The success attending the several electric power transmission systems put down by the Oerlikon Works, Switzerland, has more recently had the effect of directing attention to means of utilizing the water-power of the river Rhine near Rheinfelden. Three prominent Swiss establishments, Zschokke & Co. of Aaron, Escher, Wyss & Co. of Zurich, and the already mentioned Oerlikon Works, have taken up the matter, and have commenced the preliminary work in laying out plans for a plant. It is estimated that the Rhine can furnish about 15,000 horse-power, and this is to be distributed among the several industrial centers located within a radius of about 15 miles. To utilize the water-power 20 turbines, each rated at 750-horse power, are to be coupled directly to as many dynamos. Permission has already been sought for the erection of the primary station at Rheinfelden. The financial side of the undertaking having been disposed of satisfactorily, everything now depends upon the grant of this permission by the Government.

FLOUR MILL RATES IN AUSTRALIA.—Flour mill risks have assumed greater importance in the Colonies of late years, and an agreement respecting rates has recently been formed in Victoria, and has been signed by all the offices. It came into force on November 21 last. Its terms are extremely simple, the rates on mills within a radius of ten miles of the Melbourne General Post Office being fixed at not less than 30s. per cent. per annum for brick or stone, and at not less than 40s. per cent. per annum for iron or wood, the addition to these rates on mills outside the radius being 5s. and 10s. respectively. Grain stores, with certain exceptions, are charged the full mill rate. The tariff mill rates fixed by the British fire offices committee, are however, of an extremely elaborate character, and the proposals cover two closely printed large folio pages, the proponent being required to give the exact details regarding construction of mill, height, night work, motive power, kilns, stone rollers and discs, bridges, trees, oat-grinders, smelters, stive rooms, disintegrators, purifiers, dressing machines, &c. There is a normal rate fixed on mills complying with fifteen conditions expressed, and there are additional rates to be charged for no less than twenty-two departures from those conditions. A feature is that the greater the number of stones or rollers or discs the higher the rate, stones paying more than rollers or discs. All the provisions referred to have been rendered necessary by the improvements in the mechanical processes of milling, and inasmuch as these improvements are speedily introduced into the colonies, it is possibly advisable to provide for the exercise of greater discrimination than is suggested by the Melbourne arrangement.—*Australian Insurance and Banking Record*.

THE BEYNON ALARM.



- A. Elevator.
- B. Relief.
- C. Valve.
- D. Electric Connection of the Valve C with Bell E.
- E. Electric Bell.

When the Elevator A becomes choked the surplus material discharges at the Relief Opening B. This causes a movement of Valve C and makes electric connection with Alarm Bell E.

This device is for indicating and relieving the choking of Elevators, Conveyors, Spouts, etc., and is employed in the handling of grain and mill material.

When a choke occurs, the Bell gives an instant alarm, at the same time the Relief relieves the Elevator, Conveyor or Spout of its material.

The Electric Bell may be attached to the Spout, together with the Relief, as shown in the cut; or it may be connected to an Indicator Board and put in any convenient place in the mill. The Relief on the Spout being connected with Board and Bell by electricity, causes the Bell to ring and the Indicator to show the Spout choked, while the Relief discharges the material from the Spout.

It may also be used in connection with a clock alarm or other means of indicating. Its use on elevators greatly reduces the liability of fire by burning of the belt, and is indispensable in flouring mills.

THE BEYNON ASPIRATOR ON NEW PRINCIPLES. ROLLER ADJUSTER.

FOR ELEVATORS, CONVEYORS, ETC.

THE BEST MACHINES EVER PRODUCED

Give Capacity of Mill and ask for Illustrated Circular.

BEYNON & MURPHY

WATERTOWN, WIS.

J. B. A. KERN & SON, Merchant Millers,

Capacity 2,000 Barrels Per Day. MILWAUKEE, WIS.

Manufacturers of Choice Minnesota and Dakota Hard Wheat Flour.

RYE + FLOUR

By most approved roller process, guaranteed the best and purest rye flour manufactured. WE INVITE CORRESPONDENCE FROM CASH BUYERS.

Farrel Foundry & Machine Company,

ANSONIA, CONN.,
Sole Manufacturers of the Celebrated



ANSONIA ROLLS

FOR USE IN ROLLER MILLS.

The general experience of American Millers unites in pronouncing these rolls the very best for Flouring Mill use.

These Rolls are now used in all Leading Flouring Mills

Chilled Rolls for Paper Mills a Specialty.

[Mention this paper when you write to us.]

The "One Horse Shay."

Light, Durable, Well Made, Steel Axle and Steel Tires, Good Hickory Stock.

Sold Only to Users.

The best made ROAD CART for the money.

PRICE \$15.00. Send Postal or Express Order, Bank Draft or Registered Letter.

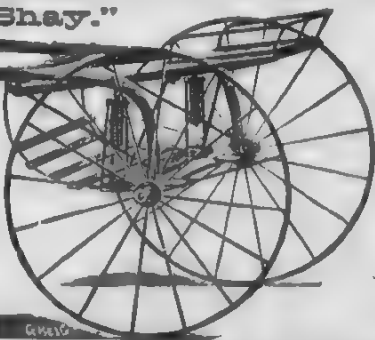
Shipped promptly on receipt of money.

Address, THE "ONE HORSE SHAY" CO.,

STERLING, ILL.

Refer to the editor of this paper.

Mention this paper when ordering.



EDW. C. ORDWAY, MILL CONTRACTOR & FURNISHER

ROLLER MILLS, GRAIN ELEVATORS, New Process Corn Meal Mills, etc.

Plans and Specifications on Short Notice. HARTLAND, WIS.

GANZ & CO.

Budapest, Austria-Hungary.

We are the first introducers of the Chilled Iron Rollers for milling purposes, and hold Letters Patent for the United States of America. For full particulars address as above.

[Mention this paper when you write to us.]

Menasha Hardwood Pulleys.



We are sole makers of hardwood bent rim, oak spoke arm, iron hub pulleys; gripped to shaft with bolts and using patent paper bushings. They can be put on shaft without taking it down or cutting key seats. No glue or nails used in their construction.

Also sole makers of only small split pulley 1 inch to 8 inches in diameter in the market. They are light, handsome and reliable. Best machine pulley made, and can be taken off or put on in five minutes. See above cut of them. No glue or nails in them. No key seats to cut. Also makers of only split loose pulley in the market. Send for circulars and discounts of Menasha Pulleys.

MENASHA SPLIT PULLEY WORKS, MENASHA, WIS.

JOHN C. HIGGINS & SON

Manufacturers and Dressers of

MILL PICKS

167 W. Kinzie St., CHICAGO, ILL.

Picks will be sent on 30 or 60 days' trial, to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the U. S. and Canada. Send for Circular and Price List.

Stilwell's Pat. Lime Extracting HEATER AND FILTER COMBINED.

Is the only Lime Extracting Heater that will Prevent Scale in Steam Boilers.

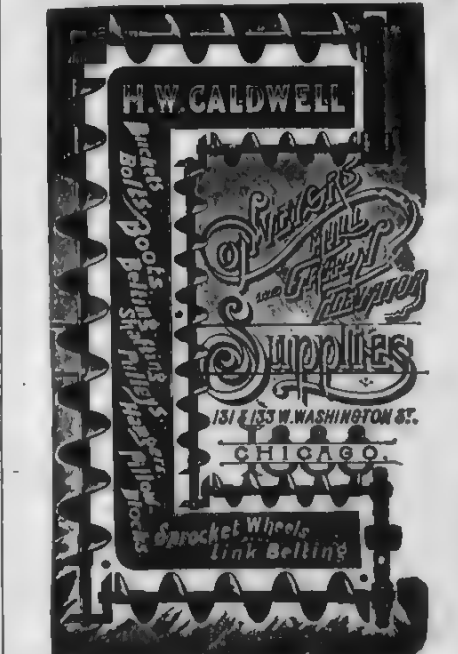
Removing all Impurities from the water before it enters the boiler.

Thoroughly tested. Over 3,000 of them in daily use.

This cut is a facsimile of the appearance of a No. 3 Heater at work on ordinary lime water when the door was removed after the Heater had been running two weeks.

Illustrated Catalogue. STILWELL & GIERCE MFG. CO. DAYTON, OHIO.

DAYTON, OHIO.



ROOFING

CEILING, SIDING, IRON DOORS, SHUTTERS. ADDRESS SCOTT & CO. CINCINNATI, OHIO.

Your Plant will be Improved Without THE RELIANCE Safety Water Columns.

They obviate all damage from either too much or too little water, and cost but little more than the common outfit.

Every Gauge Warranted.

The Reliance Gauge Co., CLEVELAND, OHIO.

Machinery For Sale

ONE PAIR 4-FT. MILLSTONES; new.

SEVEN PAIR 4-FT. MILLSTONES; used about three months.

ONE PAIR 9x18 CHILLED ROLLS; smooth.

ONE No. 1 THROOP SMUTTER AND SCOURER.

ONE 24-INCH MIDDINGS MILL.

ONE 1000-LB. PALMER POWER SPRING HAMMER.

THE MOTOR OF THE FUTURE.

OUR esteemed contemporary, *The American Journal of Railway Appliances*, has been studying the above subject. We take pleasure in making a brief extract from his essay which reads as follows:

"There was a time when wind and water acting directly upon wheels of more or less ingenious form and construction, supplied the power necessary for the rude machinery of the age. The world made a step in the direction of progress, and then steam achieved wonders.

There has now been discovered a greater, safer and cheaper power, and the steam engine is destined to occupy its place by the side of the water wheel, as one of so many old inventions which have fulfilled their mission and have been superseded.

To many of our readers this will seem like an extract from Jules Verne. To speak disrespectfully of steam will be, in their opinion, just like blasphemy against the multiplication table. Nevertheless it is already an accomplished fact that hundreds of boilers have been set aside by manufacturers and mechanics, simply because there has been discovered a better and cheaper kind of machinery by which the work of the whole world can be done. Their shops and factories are provided with the substitute, and the work is done more safely, more economically and more rapidly than before.

What is this substitute for steam? Why, electricity, to be sure.

Will electricity, then, do all that steam can do? Certainly it will, and it is destined in time to take the place of steam, just as steam has taken the place of the water wheel. No doubt, steam engines will always be used, just the same as water wheels are still used under circumstances which exclude the advantageous methods of science.

It is a revolution in science which is already under way and which is progressing with astonishing rapidity. It is true that the final results have not yet been arrived at on the score of cheapness and simplification of the methods by means of which this power is to be applied; yet it is nevertheless true that the power has been applied, and in many cases has been subjected to continuous working in factories and shops. In the supply of small power—that which machinists call 'cat-power,' in contra-distinction from 'horse-power' the electric motor has made great progress. The best illustration of its success in this respect is shown by its being applied to sewing machines, looms, cloth-cutters, and a hundred other machines, the mere enumeration of which would occupy too much space."

BELTING POINTS.

At the Erie meeting of the American Society of Mechanical Engineers, Mr. Scott A. Smith, presented a paper on "Tractive Force of Leather Belts on Pulley Faces." His conclusions were that the best belts are made from all oak tanned leather, curried with the use of cod oil and tallow. Leather so tanned, contained no free oil, which would, if of animal or vegetable origin, have a tendency to generate free acid injurious to the fiber, the pulley and belt.

"The most intimate contact of a belt with a pulley comes, First: In the smoothness of a pulley face, including freedom from ridges and hollows left by turning tools. Second: In the smoothness of the surface and evenness in the texture, or body, of a belt. Third: In having the crown of the driving and receiving pulleys exactly alike, as nearly so as is practicable, in a commercial sense. Fourth: In having the crown of pulleys not over $\frac{1}{4}$ -inch for a 24-inch face; that is to say, that the pulley is not to be over $\frac{1}{4}$ -inch larger in diameter in its center. Fifth: In having the crown other than two planes meeting at the center. Sixth: The use of any

material on or in a belt, in addition to those necessarily used in the currying process, to keep them pliable or increase their tractive quality, should wholly depend upon the exigencies arising in the use of belts; and the use of such material may justly be governed by this idea, that it is safer to sin in non-use than in over-use. Seventh: With reference to the lacing of belts, it seems to be a good practice to cut the ends to a convex shape by using a former, so that there may be a nearly uniform stress on the lacing through the center, as compared with the edges. For a belt 10 inches wide, the center of each end should recede 1-10 inch."

"Rigid belts are sometimes made pliable by saturation with 'belt-oil,' but the inevitable result—in time—is a disorganized belt; slipping will come, and the addition of more oil only results in its acting as a lubricant, by piling up on the surface."

"There is some doubt in my mind as to the desirability of perforating belts, or the drilling of pulley faces, to overcome the difficulty mentioned, so far as it comes from the air, which is not so much a real difficulty when properly made belts are used as it is with rigid belts."

THE LEEDS CORN EXCHANGE, ENGLAND.

BEING in Leeds recently to start a mill, I took the opportunity of collecting a few details of the handsome Corn Exchange, thinking that such a subject might be of interest to the readers of the UNITED STATES MILLER. Leeds, which boasts of this fine structure, is the commercial capital of the County of



Yorkshire, and is the best laid-out town in the United Kingdom. It is situated on the banks of the river Aire. Although there are no less than 1,700 streets, all more or less wide and straight, those in the central part of the town being especially noteworthy for the absence of awkward turns and perverse crookedness; indeed the improvements in this respect are such, together with the public buildings, as to constitute Leeds one of the finest manufacturing towns in the kingdom. Some Englishmen say that there is a lack of the classic sculptures of the Greek, Roman and Italian schools; but I say that the 900 factories and workshops in Leeds, can be placed in the scale of utility as real monuments of wealth, industry and commercial prestige. In fact to an American on a visit to England, a journey and stay at Leeds is quite a relief, as American comforts of locomotion in the town have been taken to heart and their commercial enterprise somewhat followed. If a map of England on which the railways are marked be examined, it will be noticed that from Leeds lines of rail radiate towards every important place in England, and the water communication, an important factor in keeping freight low, is obtained by the river Aire which passes through the town, joining the Leeds and Liverpool canal, and thus affording a direct water-carriage across the country from the eastern seaport of Hull to Liverpool. The facilities for transporting merchandise have, no doubt, had a very beneficial influence on the prosperity of the neighborhood, and the distance

from London being only 186 miles, from Hull 55½ miles, and from Liverpool 74 miles.

The Corn Exchange, herewith illustrated, is situated in Duncan street, and was opened in 1863. It is built in the form of a Roman amphitheatre, and cost about £25,000. The building is of dressed stone externally and cased internally with colored bricks. It has two porticoed entrances, the principal facing Duncan st. and the other by way of Kirkgate. The ground plan is oval, and the total area of the building is 2,055 yards. The length 190 feet, width 136 feet and height 86 feet from the basement floor. The building is covered with an iron roof having an elliptical dome rising 75 feet from the market floor. A gallery runs around the market hall, which is lighted from the top, and on market days, every Tuesday and Saturday, presents a scene of considerable animation.

L. MAYGROVE.

THE GRAIN PLANT LOUSE.

RAIN in portions of Ohio, Indiana, and Michigan have been more or less injured by an insect pest. In a recent bulletin issued by the Illinois State Entomologist we find the following:

"This insect, commonly known as the grain plant louse (*Siphonophora avenae*) is an Old World species, known for over one hundred years to infest small grain, feeding indeed on a great variety of grasses and grass-like plants, including wheat, barley, oats, rye, blue grass, foxtail and the like, but not injuring any of the crop plants outside the family of grasses. In

America it was first noticed in 1861, when it literally thronged the wheat fields of the northeastern States and Canada, from New York and Pennsylvania northward. Its injuries first attracted attention in Illinois in 1866, and again in 1876 and 1878, since which time it has not been here reported as specially injurious. Its amazing abundance this season seems due to the drouths of recent years and of the early spring, its enormous rate of multiplication enabling it to take rapid advantage of circumstances

favorable to its increase. A single female may give origin in twenty days to more than 2,000,000 young, these themselves, then multiplying at the rate of 1,000,000 a day. They rate are most conspicuous and injurious when the grains infested are filling the kernel, at which time they concentrate in the head. Besides their susceptibility to unfavorable weather they are subject to immense destruction by parasites, the most useful of which are minute 4-winged insects which lay their eggs in the bodies of the plant lice, thus giving origin to a minute grub which feeds upon the tissues of the living insect. The brown, inflated, empty crusts of plant lice which have been thus parasitized may be often seen among the living insects, each with a round hole in the back, from which the mature parasite has escaped. The attack in force of this plant louse is commonly so sudden and widespread, and its numbers are so overwhelming when it gets a fair start that there is probably nothing to be done with it that is of any practical value. So sensitive a creature can be best left to the weather bureau and its natural enemies."

A SAFETY-VALVE, in order to be, in reality, what its name implies, should be so proportioned, fitted up and piped, as to insure the boiler, to which it is attached against an overpressure of steam, when all other outlets are closed and a brisk fire in the furnace. How many engineers who read this have ever tested their safety-valves in this way?

THINGS WORTH KNOWING.

PAINT FOR SMOKE STACKS.—One of the best varnishes for steam pipes or smoke stacks is directed to be made with good asphaltum dissolved in oil or turpentine.

ONION juice is said to be an unfailing glue for making paper or paper board adhere to a metal surface. The metal should be cleaned with soda and rubbed dry with a clean rag. Cheap clock dials are prepared in this way, being printed on paper which is pasted on zinc.

THE following is a recipe for an elastic mucilage which will keep well, remain quite elastic after drying, and yet never crack or peel off: Prepare a mucilage with 93 parts of good gum arabic and 180 parts of hot water, and then strain it into a liquid mixture of 1 part salicylic acid dissolved in 20 parts of alcohol (overproof), 3 parts soft soap, and three parts glycerine, which have been thoroughly well shaken together.

TO MAKE HOLES IN STEEL.—"Sometimes I have had to make holes in steel that was too hard to cut or file easily. Then I make a mixture that will cut a hole. I mix one ounce of sulphate of copper, quarter of an ounce of alum, half a teaspoonful of powdered salt, a gill of vinegar, and twenty drops of nitric acid. This will make the hole, or if it is washed off quickly it will give a beautiful frosted appearance to the metal."

NEW COMPOSITION FOR SOFTENING LEATHER.—Dr. Alexander Zoroastroff of Belostok emphatically recommends to people working about water, a grease for boots which is said to completely prevent sore feet, and so protects pedestrians from the whole train of familiar affections caused by that minor accident. The ointment is made of four parts of lard, four parts of olive oil, and one part of caoutchouc (raw rubber), melted together on a slow fire. Having moistened the sole of the boot with water, the inventor warms the boot in a stove or before a fire, and then smears it over with the compound. The boot is said to become soft, pliable, shining, waterproof, and even more durable.

A USEFUL CEMENT.—The following mixture has been used with the greatest possible success for the cementing of iron railing tops, iron gratings to stoves, etc.; in fact with such effect as to resist the blows of a sledge hammer. This mixture is composed of equal parts of sulphur and white lead, with about one-sixth proportion of borax, the three being thoroughly incorporated together, so as to form one homogeneous mass. When the application is to be made of this composition, it is wet with strong sulphuric acid, and a thin layer of it is placed between the two pieces of iron, these being at once pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the work having every appearance of welding.

NEW CUSTOMS DUTIES ON RYE AND RYE FLOUR.—The *Journal Officiel* for the 17th April last publishes the text of a decree of the French President, establishing new Customs duties on rye and rye flour as follows:—

Rye in the grain, if of European origin, or imported directly from a non-European country, 3 frs. per 100 kilos; if of extra-European origin, imported from European *entrepôts*, 6 frs. 60 cts. per 100 kilos.

Rye flour, if of European origin, or imported directly from a non-European country, 5 frs. per 100 kilos; if of extra-European origin, imported from European *entrepôts*, 8 frs. 60 cts. per 100 kilos.

To prevent the loss of power in belts cover the surface of the pulley with papier-mache. To be applied by chemically prepared cement. It will firmly adhere in a few hours and thus become a part of the pulley.



Fast Mail Line with Vestibuled Trains between Chicago, Milwaukee, St. Paul and Minneapolis.

Trans-Continental Route between Chicago, Council Bluffs, Omaha and the Pacific Coast.

Great National Route between Chicago, Kansas City and St. Joseph, Mo.

5700 Miles of Road reaching all principal points in Illinois, Wisconsin, Minnesota, Iowa, Missouri and Dakota.

For maps, time tables, rates of passage and freight, etc., apply to the nearest station agent of the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY, or to any Railroad Agent anywhere in the World.

ROSWELL MILLER, A. V. H. CARPENTER,
General Manager, Gen'l Pass. and Tkt. Agt.

For information in reference to Lands and Towns owned by the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY, write to H. G. HAUGEN, Land Commissioner, Milwaukee, Wis.

THE CHICAGO AND NORTH-WESTERN RAILWAY.

OVER 7,000 MILES

Of steel track in Illinois, Iowa, Wisconsin, Michigan, Minnesota, Nebraska, Dakota and Wyoming, penetrates the Agricultural, Mining and Commercial Centres of the **WEST AND NORTHWEST.**

The Unrivalled Equipment of the Line embraces Sumptuous Dining Cars, New Wagner and Pullman Sleepers, Superb day Coaches and

FAST VESTIBULED TRAINS Running direct between Chicago, St. Paul and Minneapolis, Council Bluffs and Omaha, connecting for Portland, Denver, San Francisco and all Pacific Coast Points.

ONLY LINE TO THE BLACK HILLS For Tickets, Rates, Maps, Time Tables and full information, apply to any Ticket Agent, or address the Gen'l Passenger Agent, Chicago, Ill. **J. M. WHITMAN, H. C. WICKER, E. P. WILSON,** General Manager, Traffic Manager, Gen'l Pass. Agt.

NOTES

from the diary of tourists, commercial travelers, business men and others has revealed:

That the Wisconsin Central has the unqualified endorsement of all:

That the Wisconsin Central has to-day the most popular line between Chicago and Milwaukee, and St. Paul, Minneapolis and the Northwest;

That the Wisconsin Central is daily adding to its admirers as the recognized Pullman line between Chicago and Milwaukee and Ashland, Duluth and Lake Superior;

That the Wisconsin Central touches the most prominent points in Wisconsin, and that it has more important business centers on its through line than any other railway to and from the Northwest;

That the Wisconsin Central has made an enviable reputation with its peerless Dining Car Service;

That the Wisconsin Central runs fast trains on which all classes of passengers are carried with commodious and distinct accommodation for all;

That the Wisconsin Central has representatives distributed throughout the country, who will cheerfully give any information that may be desired and that its terminal Agents are specially instructed to look after the comfort of passengers who may be routed via its line.

For detailed information, apply to your nearest Ticket Agent; or to representatives of the Wisconsin Central Company.

S. R. AINSLIE, H. C. BARLOW,
General Manager, Gen'l Traffic Manager.

LOUIS ECKSTEIN,
Asst. Gen'l Pass. & Tkt. Agt.

MILWAUKEE, WIS.

ALL persons desiring to reach the entire milling and grain trade of America, by circular or otherwise, should obtain a copy of CAWKER'S AMERICAN FLOUR MILL AND ELEVATOR DIRECTORY FOR 1888.

We shall be pleased to receive from any of our readers, short, crisp, sensible letters on subjects of interest to the flour and grain trade for publication.

EXPORTING millers should write to the Riverside Printing Co., Milwaukee, Wis., for the best Flour Cable Code ever published. There are more copies of this Code in use than of ALL other flour codes published. It is simple and accurate.



THE MILWAUKEE LAKE SHORE & WESTERN R'Y
IS THE DIRECT AND MOST POPULAR LINE AND THROUGH SLEEPING AND PARLOR CAR ROUTE FROM **CHICAGO AND MILWAUKEE**

TO SHEBOYGAN, MANITOWOC, APPLETON, NEW LONDON AND WAUBSAU, TO ALL THE IMPORTANT TOWNS IN THE Gogebic, Peneke and Montreal Iron Ranges, HURLEY, BEECHER, IRONWOOD, WAKEFIELD AND GOESBIO, TO

ASHLAND, SUPERIOR AND DULUTH, To all Fox River Manufacturing Cities AND The Lumbering Districts of Northern Wisconsin and Michigan.

SPORTSMEN The best Fishing and Hunting in the NORTHWEST reached by the **ASHLAND ROUTE.** Send to the General Passenger and Ticket Agent for Descriptive and Illustrated Publications, Maps, Folders, Time Cards and General Information.

Milwaukee Office, 95 Wisconsin St.

H. G. FLEITH, F. P. REGAN,
Com. Freight Agt. City Pass. & Tkt. Agt.

H. F. WHITCOMB, ERNEST VLIET,
General Manager, Gen'l Pass. & Tkt. Agt.
MILWAUKEE.

Milwaukee & Northern R. R. SHORT LINE

Marquette, Negaunee, Ishpeming, Hancock, Houghton, Champion, Republic, Iron Mountain, Menominee, Mich. Marinette, Green Bay, Depere, Neenah, Menasha, Appleton, Wis.

THE TABLE OF EXPRESS TRAINS.

| STATIONS. | DEPART. | ARRIVE. |
|---|------------|-------------|
| Champion, Republic, | 1:35 A. M. | 8:30 A. M. |
| Iron Mountain, Menominee, | 1:35 A. M. | 8:30 A. M. |
| Marinette, Green Bay, | 3:10 P. M. | 8:55 P. M. |
| Depere, | 7:35 A. M. | |
| Green Bay, Depere, Appleton, Menasha, Neenah, | 7:55 A. M. | 3:55 P. M. |
| | 3:10 P. M. | 10:30 A. M. |

*Daily, except Monday. All other trains daily except Sunday. Pullman Sleeping Cars are run on all night trains, and are ready for occupancy at 9:00 P. M. New Passenger Station, Fourth Ward Park.

C. F. DUTTON, W. B. SHEARDOWN,
General Manager, General Ticket Agent.

A NIGHT IN CHICAGO -AND A- NIGHT TRAIN TO INDIANAPOLIS.



LOUISVILLE, NEW ALBANY & CHICAGO BY, HAS A TRAIN

Leaving Chicago AT 11:40 P. M.

EVERY NIGHT (Sundays included), with THROUGH COACHES and PULLMAN SLEEPERS, ARRIVING INDIANAPOLIS at 7:30 A. M.

ADDITIONAL TRAINS leave Chicago for Indianapolis at 8:15 A. M. and 8:30 P. M. Ask your home Agent to make your tickets read via the MONON ROUTE, so your comfort may be assured. For further information, Sleeping Car Berths, etc., call at

CITY TICKET OFFICE, No. 73 CLARK ST.

-OR AT THE-

DEARBORN STATION, CHICAGO.

JAMES BARKER, Gen'l Pass'r Agent, CHICAGO.

PRIVATE TELEGRAPHIC CIPHER CODE

Compiled Expressly for the use of

Millers, Flour & Grain Brokers

For Private Telegraphic Correspondence, either for Land or Cable Lines.

1888 Edition, just out, March 1, 1888, revised, amended and added to, to meet all the requirements suggested by the members of the Miller's National Association, who use more copies of the Code than all others combined.

Published by the Riverside Printing Co., Milwaukee, Wis. For terms, etc., address, stating number of Codes probably wanted.

RIVERSIDE PRINTING CO., Milwaukee, Wis.



THE THROUGH CAR LINE FROM AND TO CINCINNATI

WITH THROUGH CAR SERVICE BETWEEN

CINCINNATI and INDIANAPOLIS, CINCINNATI and TOLEDO and DETROIT, CINCINNATI and CHICAGO, CINCINNATI and ST. LOUIS, CINCINNATI and DAYTON and RICHMOND, CINCINNATI and FT. WAYNE and GRAND RAPIDS, CINCINNATI and GREENVILLE and VAN WERT.

With THROUGH RECLINING CHAIR CAR between CINCINNATI, DECATUR and SPRINGFIELD, ILLS. and KEOKUK, IOWA, (daily)

PARLOR CHAIR CARS ON DAY, and SLEEPERS ON NIGHT TRAINS, "YEAR 'ROUND."

Ask for Tickets via C. H. & D. R. R.

For full information, Tickets, Sleeping Car Space, etc., Inquire of or Address, **W. H. FISHER, Gen'l Agt., Indianapolis, Ind.** **W. H. WHITNEY, Central Pass'r Agt., Dayton, O.** **John Bartable, District Pass'r Agt., Toledo, O.** **B. M. Tracey, Northern Pass'r Agt., Detroit, Mich.** **W. A. Wiest, Southern Passenger Agent, Chattanooga, Tenn.** **J. G. Mason, City Passenger Agent, Cincinnati, O.**

Or General Passenger Agent's Office, - No. 200 W. Fourth St., Cincinnati, O.

C. C. WAITE,
Vice-Pres't & Gen'l Manager.

CHAS. H. ROCKWELL,
Gen'l Pass'r & Ticket Agent.

Chicago & Grand Trunk R'y

NIAGARA FALLS AIR LINE

Is the Shortest and Most Direct Route East.

THROUGH SLEEPING AND PARLOR CARS TO

New York, Montreal and Boston.

The Only Line running Through Sleeping Cars between

CHICAGO and PHILADELPHIA

Via NIAGARA FALLS Without Change.

Trains leave Dearborn Station at 9:05 a. m., 3:35 p. m. and 8:15 p. m. 8:15 p. m. train has elegant Pullman Sleeping Car to Detroit daily.

GRAND HAVEN ROUTE.

Detroit, Grand Haven & Milwaukee, R'y,

Is the Shortest, Cheapest and Quickest Line between MILWAUKEE, Points in MICHIGAN, CANADA and the EAST.

A delightful 5 Hour Daylight Trip on the Palace, Iron Side Wheel Passenger Steamer,

CITY OF MILWAUKEE.

Steamer leaves Milwaukee daily at 11:30 A. M. connects at Grand Haven at 5:30 P. M. with Fast Limited Express, which reaches Detroit, 11:30 P. M.; Niagara Falls, 7:30 A. M.; New York, 10:00 P. M.

34 Hours Milwaukee to New York.

Round Trip Tourist Tickets to the Thousand Islands, Rapids of the St. Lawrence, Mountains and Sea Shore now on Sale. Pamphlets descriptive, Rates, Routes, etc., sent by mail from Company's Office, 99 WISCONSIN STREET.

2nd class tickets good on all trains.

W. E. DAVIS, E. E. EUGENE, E. C. MEDDAUGH,
Gen'l Pass'r & Ticket Agent, Gen'l Western Pass'r Agent, Nor. Pass'r Agt., CHICAGO. CHICAGO. MILWAUKEE.

STEAMSHIP TICKETS

To or from Europe at lowest rates, by all lines. Cabin plans can be consulted and best accommodations secured as far in advance as desired.

Information furnished by mail or on application at office, 99 Wisconsin St., southwest cor. Broadway. **B. C. MEDDAUGH, Gen'l S. S. Agent, MILWAUKEE, WIS.**

Goodrich Passenger Steamers

TWICE DAILY EACH WAY BETWEEN

MILWAUKEE & CHICAGO.

CHICAGO AND RACINE LINE.

| Leave Milwaukee. | FOR | Arrive at Milwaukee |
|------------------|---------|---------------------|
| 7:00 P. M. | Chicago | 5:00 A. M. |
| 7:30 A. M. | Chicago | 4:00 P. M. |
| 7:00 P. M. | Racine | 5:00 A. M. |

FARE TO CHICAGO ONLY \$3.00.

ROUND TRIPS, \$3.50. Meals and berths included on first-class tickets. Sure connections at Chicago with all morning trains for all points east, south and southwest.

*Sheboygan and Manitowoc Line.—
*Daily..... 7:00 A. M. Arrives..... 5:00 A. M.
Sundays..... 7:00 P. M.

Keweenaw and Annapee Line.— Tuesdays, Wednesdays, Thursdays, Saturdays and Sundays at 7:00 A. M.

Menominee and Sturgeon Bay Line.— Tuesdays, Wednesdays, Thursdays, Saturdays and Sundays at 7:00 A. M.

Green Bay and Depere Line.— Wednesdays and Sundays at 7:00 A. M.

Manistique, Thompson and Gladstone Line.— Wednesdays and Sundays at 7:00 A. M.

Fayette, Garden and Nehma Line.— Wednesdays, Saturdays and Sundays at 7:00 A. M.

Escanaba Line.— Tuesdays, Wednesdays, Thursdays, Saturdays and Sundays at 7:00 A. M.

Bailey's Harbor and Jacksonport Line.— Wednesdays at 7:00 A. M.

Fish Creek, Egg Harbor and Sister Bay Line.— Tuesdays, Thursdays and Saturdays at 7:00 A. M.

Close connections with railroad at Escanaba for Negaunee, Ishpeming, Quinnesec, Norway and all Lake Superior points.

The new steamer City of Racine will be the daily 7:00 P. M. boat out of Milwaukee for Chicago, except Sunday nights. The steamer Chicago will be the Sunday night boat.

C. HURSON, Secretary and Agent.

THOS. FORBES, Passenger Agent.

*Except Sundays and Mondays. *Except Mondays.



94 MILES THE SHORTEST, 8 HOURS THE QUICKEST, CINCINNATI TO NEW ORLEANS

Time, 27 Hours.

Entire Trains, Baggage Car, Day Coaches and Sleepers run through without change.

110 MILES THE SHORTEST, 7 HOURS THE QUICKEST, CINCINNATI to JACKSONVILLE, Fla.

Time, 26 Hours.

Through Sleepers without change. The Short Line between Cincinnati and

| | |
|---------------------|--------------------|
| Lexington, Ky., | Time, 3 1/4 Hours. |
| Knoxville, Tenn., | " 13 " |
| Asheville, N. C., | " 17 " |
| Chattanooga, Tenn., | " 11 " |
| Atlanta, Ga., | " 15 " |
| Birmingham, Ala., | " 16 " |

Direct Connections at New Orleans, and Shreveport, for Texas, Mexico and California.

Trains leave Central Union Depot, Cincinnati, crossing the Famous High Bridge of Kentucky, and rounding the base of Lookout Mountain.

Over One Million Acres of Land in Alabama, the Future Great State of the South, subject to pre-emption. Unsurpassed Climate.

For Rates, Maps, etc., address,

C. S. HENRY, Traveling Passenger Agent,
193 Clark St., Chicago, Ill.

J. C. GAULT, CINCINNATI, D. G. EDWARDS,
Gen'l Mgr. OHIO. G. P. & T. A.

DO YOU INTEND TO BUILD? PRACTICAL LOW-COST HOUSES. HOW TO BUILD THEM.



A Large Atlas, containing drawings and floor plans of 40 Modern Houses with Correct Estimates of cost of building, all kinds of buildings ranging from a \$400 cottage to a \$10,000 residence. The latest, most complete, and only practical book published. It is false economy to attempt to build without these plans. Price by mail, post-paid, 50 cts. Stamps taken.

Address, UNITED STATES MILLER, Milwaukee, Wis.

CAWKER'S AMERICAN FLOUR MILL AND ELEVATOR DIRECTORY FOR 1888-89, issued March 3, 1888, a work that should be in everyone's hand that desires to reach the entire flour and grain trade. While not claimed by the publisher to be perfect, it answers FULLY the requirements of the trade. It is the only list published. The demand is limited and the price (Ten Dollars per copy) is cheap, considering the labor required in compiling, printing and selling. It contains lists of flour mill and grain elevator owners, miscellaneous kinds of mills such as corn, rye, oatmeal, rice and feed mills, millwrights, flour brokers and dealers in various sections of the United States and Canada, and a good list of European flour and grain importers. Kind of power used, rolls or stones, capacity and millers supposed to be worth \$10,000 or more are indicated in thousands of cases.

MENASHA PULLEYS SHIPPED BY MAIL.

THE Menasha Wood Split Pulley Co. of Menasha, Wisconsin, having had such great success with their hard-wood, bent-rim pulley, which is now universally used in all first-class mills and factories in this country, have recently introduced to the trade a new departure in split pulleys. It is the smallest split pulley made. It is designed for use as a split pulley from 1 inch to 8 inches in diameter. There are no iron or wooden split pulleys made so small in diameter except this one. The smallest split pulley made by other manufacturers, of either iron or wood, is 9 inches in diameter. These Menasha split pulleys were patented last April. There has been a long-felt want among all classes of manufacturers for a small split pulley, smaller than could be made with fellows or bent rim or by any of the known means of manufacturing split pulleys, and the Menasha people after considerable experimenting have finally succeeded in producing this small split pulley. It is made of the hardest Wisconsin hard woods as



[Above cut shows construction of small pulley. The bolts that clamp the shaft are entirely out of sight when on the shaft. The nuts and heads are covered by the caps as shown in cut. The grip on shaft is perfect. Nuts can be easily got at to grip it tightly. The cap is held on by stove bolts.]



[Above cut shows small split pulley set up, as it appears on shaft. They are made any size and from 1 inch diameter up to 8 or 10 inches.]

seen in the above cuts. It has a regular hub through which the bolts are placed in such a manner as to be readily accessible to the millwright for adjustment to the shaft. The heads and ends of the bolts are covered by the cap as seen in the cut, which cap is fastened to the hubs by a stove bolt. The pulley is gripped to the shaft and when necessary to change the size of the bore in the pulley, the patent paper bushing which this company uses on all of its split pulleys, is inserted in the hub to change the size of the bore. The pulley may be adjusted to the shaft; no key-seats are necessary to be cut, and no set screws are used. It is absolutely reliable in its grip on the shaft. The pulleys are very handsome. They are light, cheap and stronger than any iron pulley ever made. They are absolutely in perfect balance and are 70 to 90 per cent. lighter than iron pulleys. Any machinery concern or pulley dealer can with a small stock of them fill almost any order he will have. The smaller ones may be easily shipped by mail, and all of them may be easily shipped by express. These small split pulleys are specially designed to take the place of all iron counter-shaft, main-shaft and machine pulleys that have to be cast, around the country at the foundries. They can be had for one-half the expense of iron pulleys. By using them on machinery of all kinds it will very materially reduce the price of freight.

Menasha people are to be congratulated upon their success in producing such a fine article of machinery, and though they have been manufacturing them but about four months, they have now a trade in these small pulleys that reaches all over the United States, and a force of men are constantly pushing their manufacture.

The Company has recently issued a very handsome circular illustrating all of their wood split pulleys, which they are pleased to send to any one desiring it.

In a future article we shall describe their hard wood bent rim oak spoke arm and iron hub-pulleys, which are the only hard wood bent rim pulleys manufactured. By their system of bushing with pure friction board they have developed a grip on the shaft that is absolutely reliable and which enables them to make and hold to the shaft absolutely the largest wooden pulleys in the market. They can manufacture any size wooden pulley.

SONG OF THE BUGS.

The sluggish "chinch bug," he eats grain,
The lively grasshopper feeds on grass,
While the "tater bug" comes in after the rain
And chews up the farmer's garden sass.
The "Hessian fly," a bug without hair,
Who takes his meals from the granger's wheat,
He and the "bull bug," best friends of the bear,
Till the "green bug" made his debut on the street.
—Boston Beacon.

And the Indians "house," he gets what is left;
Insecticide's unknown when the crop's in the cream;
Then the "weevil" comes after, much lacking in beft,
But enough to post hot-stuff and make the bulls
scream.—Baltimore Journal of Commerce.

But the bug of all bugs that do the most harm
Whether the market be up or down,
Is the "city crop reporter" and the bloomin' granger
"croaker."

With a 10-per cent. mortgage on the dear old farm.
[NOTE.—The U. S. Miller and Milling Engineer requests the judges in this "buggy" race to allow all entries a fearful amount of poetical latitude and longitude—"unbridled license" as it were.]

GOVERNMENT CROP REPORT.

Official Estimate of the Condition of the Crops July First.

THE Government crop report for July is a lengthy document. It arrived here July 12.

The returns make an increase in the area planted in maize of 1,300,000 acres and the total over 77,000,000. This is only a preliminary estimate, subject to revision after more thorough census tests now in progress. The largest increase is west of the Mississippi. There is a small enlargement of breadth in some of the southern states, but in the eastern and middle states, taken together, there is no increase.

The condition of the crop is only medium, lower than usual at this period of its development. Excessive moisture has delayed planting, and lower temperature and saturated soil have retarded growth on the Atlantic coast north of South Carolina. In the cotton states May was cold and at most points dry, and in June wet to excess. On the 1st of July it was in some danger of injury from excess of moisture, even in Texas, though the early planted was in the roasting-ear stage, and in some places harvested and a second crop planted.

In the Ohio valley condition is lower than elsewhere. The extreme cold weather of the latter part of May and the first part of June was very unfavorable to germination, and the frosts of that period injured or destroyed that which was above ground. The replanting was slow and the plants are therefore small, though thrifty and growing. In Michigan there has been some loss of area by plowing up and seeding to millet from failure to obtain a stand.

Cut worms have been very destructive in the west. More advanced fields in this region which should have been cultivated four times at this date have only been plowed twice. The crop is therefore late and dependent on July weather for improvement, while exposed more than usual to possible adverse conditions.

The maize of the northern border from Wisconsin to Dakota suffered from the abnormal cold of May and early June, but looks quite as well now as in the Ohio valley.

West of the Mississippi, in the sub-humid belt and border of the arid region, the crop is generally in fine condition, though injured at points by overflows and excessive moisture. The Great American desert is green with the great American cereal in high development.

The general average of condition is about 90, and the averages of principal states are: New York 80, Pennsylvania 88, Virginia 90, Georgia 95, Texas 98, Tennessee 92, Kentucky 90, Ohio 81, Illinois 82, Wisconsin 83, Minnesota 87, Michigan 70, Indiana 81, Iowa 95, Missouri 92, Kansas 97, Nebraska 98, Dakota 83.

The condition of winter wheat is well sustained, notwithstanding injury by storm and flood. The general condition standing at 92. The former complaints of "threatened by drought" are displaced by statements of some actual damage from abundant rains. Occasional reports of injury from the Hessian fly, the chinch-bug, the midge, and rust are received, but the local estimates of condition do

FOR SALE AND TO RENT.

[Short ads. inserted in this column for \$1 per insertion.]

FOR SALE. A full roller process flouring mill, 100 barrels capacity. Equipped with most approved modern machinery. Built less than one year. Citizens gave a bonus of \$2,500, which I will allow to purchaser of mill. Having an interest in a mill furnishing business, I desire to give it all my time. Full particulars on application. H. C. DUTTON, Port Austin, Mich.

FOR SALE. A good water-power roller mill of about 60 bbls. daily capacity. Address for full information, UEBLING & BODDEN, Afton, Wis.

FOR SALE. The "Central Mills," of 800 barrel capacity, situated in the thriving city of Atchison, Kas., with a good wheat crop, and the business fully established to go right ahead. Satisfactory reasons for selling. For further information address WM. BOWMAN, Atchison, Kas.

WANTED.

WANTED. A partner who will devote his time to the business, with some means, to rebuild a water power mill in Toledo, on the site of the Armada Mills (lately burned.) It is the best site in the city, and the best city in America for a flouring mill to grind either winter or hard spring wheat. Correspondence solicited. F. N. QUALE, TOLEDO, OHIO.

SOUTH TIMBER LANDS.

An experienced land man, native of the South, active and intelligent, wants a position with some reliable Northern firm dealing in Southern timber lands, to locate and select cheap timber lands in the South. References. Address, SOUTH TIMBER LANDS, P. O. Box 1297, NEW ORLEANS, LA.

The INK used on this paper is from the factory of

CHAS. ENEU JOHNSON & CO.,
PHILADELPHIA, PA.

Western Branch House: 40 La Salle St., CHICAGO

not indicate much damage. Probably the resulting damage may be more fully disclosed by the books of the threshers.

In the heart of the west the harvest is generally finished by this date. It is completed in the south and threshing is in progress. The average of condition of principal states are as follows: New York 96, Pennsylvania 96, Virginia 90, Georgia 94, Texas 86, Tennessee 95, Kentucky 88, Ohio 88, Michigan 89, Indiana, 89, Illinois 94, Missouri 94, Kansas 98, California 97.

The straw is generally short and unusually well headed and plump in grain, though in some places it is somewhat shriveled. Fears were entertained of injury in the shock after harvest, which the change of weather may prevent.

The returns concerning spring wheat in Dakota are very unfavorable from results of long-continued drouth. Rains late in June had improved the situation, but the general average as consolidated is 62. Results are extremely variable, from a good yield down to a bushel per acre. In some sections, as reported, the grain is already heading out with straw six inches high. The averages of Wisconsin and Nebraska are each 95; Iowa, 97; Minnesota, 87; and the averages of Montana, Idaho and Washington are low. The general average is about 83, which is very low at this stage of growth.

Rye maintains its condition and barley declines to about 92.

AN ENGLISH SYNDICATE AND MINNEAPOLIS FLOUR MILLS.

THE Northwestern Miller of July 11 says editorially:

"We announced in our issue of May 24 that the rumor which was current to the effect that an English syndicate was figuring to purchase several of the larger mills in Minneapolis and combine them into one corporation was not entirely unfounded in fact. The original scheme was supposed to have been dropped, but either the same parties, or others connected with them, re-opened negotiations, which have been going on ever since and which may possibly culminate in the transfer of several mills from their present owners to outside purchasers. During the last thirty days rumors of these facts have been flying thick and fast and have been of the wildest and most improbable character. It has been stated that representatives of British capital were endeavoring to obtain control of the milling business in various cities, including Minneapolis, St. Louis, Buffalo and Rochester. Our correspondent at the last named place quotes the opinions of various prominent Rochester millers on the subject,

AN AUTHENTIC BUYERS' GUIDE.

MILL AND ELEVATOR BUILDERS, MILL FURNISHERS, MANUFACTURERS OF AND DEALERS IN MILL AND ELEVATOR MACHINERY AND SUPPLIES.

Cards will be inserted under this heading in the "U. S. Miller," not exceeding three lines, copy of paper included, for FIVE DOLLARS per year, cash with order. Additional lines, \$1.00 each, per year.

Edw. P. Mills & Co., Milwaukee, Wis., builders of complete Flour Mills, manufacturers of Flour Mill Machinery, and dealers in Supplies of every description. [Mr. 89.]

John C. Higgins & Son, 165 West Kinzie Street, Chicago, Ill., mfrs. of and dressers of Mill Picks. [Mr. 89.]

H. P. Yale & Co., Milwaukee, Wis., Manufacturers' Agents of Engines and Boilers, New York Leather Belting Co.'s Leather Belting, Dodge Wood Pulley.

Robert Peole & Son Co., Baltimore, Md., manufacturers of Steam Engines, Water Wheels, Flour, Corn, Paper, Saw and Cotton Mill Machinery.

W. A. Clark & Co., Salem, O., manufacturers of "SALEM" Elevator Buckets, etc. [Mr. 89.]

R. C. McCulley, (P. O. Box 214) Lancaster, Pa., manufactures Cob Crushers, Cooper's Stoves, Castings, Patterns, etc. [Mr. 89.]

B. M. & J. Sanford, Phoenix Iron Works, Sheboygan, Falls, Wis., manufacturers of the "IMPROVED WALSH DOUBLE TURBINE WATER WHEEL." [Mr. 89.]

John C. Kilner, York Foundry and Engine Works, York, Neb. Mill and Elevator machinery of all kinds, Engines, Hoilers, Pulleys, Shafting, etc. [Mr. 89.]

The Gutta Percha and Rubber Mfg. Co., 150-161 Lake St., Chicago, Ill., Belting and Rubber Goods. [Mr. 89.]

Richmond Mfg. Co., Lockport, N. Y., manufacturers of Grain Cleaning Machinery, Bran Dusters, etc. [Mr. 89.]

N. Y. Belting and Packing Co., N. Y. Leather Belting Co., W. D. Allen & Co., Agents, 151 Lake Street, Chicago. [Apr. 89.]

W. G. Avery Mfg. Co., 10 Vincent St., Cleveland, O., Specialists: Avery Lever Bolt Punches, Avery Seamless Elevator Buckets, Belting, Elevator Bolts, etc. [May 89.]

The M. J. Deal Specialty Co., Bucyrus, Ohio. Headquarters for Flour and Grain Testing Appliances, and Specialties for the Milling, Flour and Grain trades. [May 89.]

A. B. Bowman, 223 Second St., St. Louis, Mo., manufacturers of Wheat Heaters.

Sprague Electric Railway & Motor Co., 16 and 18 Broad St., New York. Electric Motors. Electric Transmission of Power.

Stillwell & Bierco Mfg. Co., Dayton Ohio. Mill Builders, Manufacturers of and dealers in Water Wheels, Feed Water Heaters and Flour Mill Machinery and Supplies.

Milwaukee Bag Co., No. 236 East Water St., Milwaukee, Wis., manufacturers of plain and printed Flour and Grain Sacks of all kinds.

B. F. Ryer, 66 S. Canal St., Chicago. Mill Furnisher. Boiling Cloths made to order.

Jas. Leffel & Co., Springfield, Ohio. Water Wheels.

Vacuum Oil Co., Rochester, N. Y. Oils.

some of them quite pertinent, but all showing that while the miller there might be willing to sell if they had a good chance, they are ignorant of any attempt in the direction of a purchase having been made.

"We do not think that even any preliminary figuring has been done in any of the cities named except Minneapolis. In the latter place there is ground for the supposition that a transfer may be made. An option on several valuable plants has been given to certain financiers representing outside capital. The properties included in the proposed syndicate are those of C. A. Pillsbury & Co., Washburn Mill Company, the Washburn Flouring Mills Company, the east and west side water powers and the Pillsbury system of elevators. This would give the purchasers a combined capacity of 22,000 barrels of flour per day, the control of the water power and a valuable elevator system. For some time past accountants sent to Minneapolis have been examining the books of various establishments included in the deal, and verifying the statements of the millers as to their profits. Should the deal be consummated, C. A. Pillsbury will manage the entire business, which will be capitalized at from \$8,000,000 to \$10,000,000. It is known that the sellers receive a good price for their interests, but not an exorbitant one. Even on the capital above given the stockholders will receive a very fair dividend on their investment, basing calculations on the results of the business for the past six years.

"The milling interests included in the proposed deal are the largest in Minneapolis, and several of the mills have been great money-makers in the past and will undoubtedly continue in the same course if properly managed. As far as the mills of the Washburn Flouring Mills Company, the Washburn A, B and C are concerned, they will be operated for at least a year from Sept. 1 by the Washburn-Crosby Company, successors to Washburn, Martin & Co., whether the proposed transfer in ownership is or is not made. It is probably a trifle premature to speculate on the effect of this proposed movement on the general milling business of the country and especially of the spring wheat section. It may not be carried out, although the probabilities are otherwise. A large number of millers think that it will be an unfortunate thing for the trade at large, and there is some talk of other combinations being made to compete with it."

G. M. MANN.

F. F. MANN

MILWAUKEE BAG COMPANY,

MANUFACTURERS OF

COTTON, PAPER AND JUTE FLOUR SACKS

DEALERS IN

Grain Bags, Twines, Centals, Etc.

TELEPHONE NO. 427.

No. 236 East Water Street,

MILWAUKEE, WISCONSIN.

SCHIEREN'S
OAK-TANNED
LEATHER BELTING

Cotton Belting and Hose



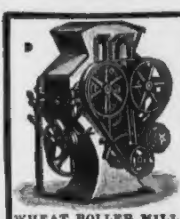
"Gold Seal" Rubber Belting.

PRICE LIST SENT ON APPLICATION.

372 & 374 EAST WATER STREET
MILWAUKEE.

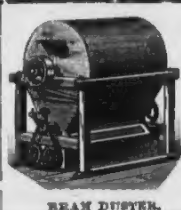
131 EAST THIRD STREET
ST. PAUL.

201 NICOLLET AVENUE
MINNEAPOLIS.

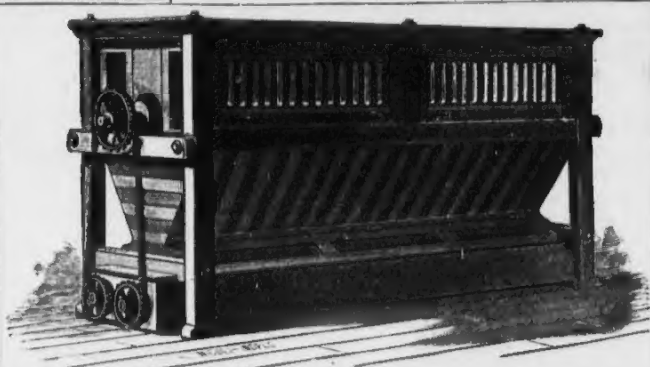


WHEAT ROLLER MILL.

THE
J. B. ALLFREE COMPANY,
Indianapolis, Indiana,
manufacture this superior line
—OF—
MACHINERY



BEAN DUSTER.



THE "SUCCESS" BOLTER.



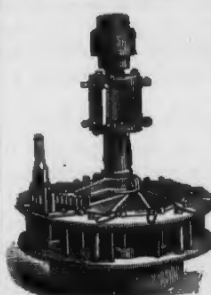
CORN MILL.

Also
AUTOMATIC ENGINES,
Pulvers,
SIEVE SCALPERS,
Corn Pearlers and Corn Cleaners,
Centrifugal Reels.

Address for prices, etc.,
THE J. B. ALLFREE COMPANY,
Indianapolis, Indiana,
Mill Builders and Mill Furnishers.



FLOUR PACKER.



ROBERT POOLE & SON CO.,
Leffel Turbine Water Wheel

Made of best material and in best style of workmanship.

Machine Molded Mill Gearing

From 1 to 30 feet diameter, of any desired face or pitch, molded by our own SPECIAL MACHINERY. Shafts, Pulleys, and Hangers, of the latest and most improved designs.

Mixers and General Outfit for Fertilizer Works.

Shipping Facilities the Best in all Directions.

ROBERT POOLE & SON CO., BALTIMORE, Md.

N. B.—Special attention given to Heavy Gearing for Pulp and Paper Mills.

[Mention this paper when you write to us.]

WM. PLANKINTON, President.
FREDERICK D. DAY, Treasurer.

CAPITAL STOCK, \$100,000.

GEO. N. SOBERS, V. Pres't & Mgr.
J. G. THOMPSON, Secretary.

Milwaukee Brass and Copper Works
MILWAUKEE, WIS.

BABBITT METALS,
(Standard and Special Mixtures).

Brass and Bronze Castings.

Ingot Metals.

Our "Badger State Metal" is the best anti-friction Metal on the market.
We make a specialty of furnishing special mixtures to large consumers,
putting on buyer's brand when desired.

MILWAUKEE BRASS AND COPPER WORKS, MILWAUKEE, WIS.

Send for Circular and Price Lists.

Mention this Paper.

STILWELL & BIERCE MFG. CO.

—* DAYTON, OHIO, U. S. A. *—

MILLING ENGINEERS

Manufacturers of the Celebrated ODELL ROLLER MILLS and a full line of

Flour and Corn Mill Machinery.

MILLS BUILT ON THE

ODELL SYSTEM.

Contracts taken for mills of any size, large or small, and results GUARANTEED.